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Mrs. Harry Greening of Toronto and H. R. Duckwall of Indianapolis aboard Mr. Duckwall's express cruiser Hoosier VI. The land in the distance is Bimini, that celebrated Bahama island

ARTHUR J. UTZ, of the Eastern Branch of the Hall-Scott Co., told us recently that over 75% of the inquiries which his company receives as the result of its advertising in the boating papers come from readers of MoToR BoatinG. Although the Hall-Scott Company advertises liberally in practically all of the boating journals it is not surprising that nearly all its inquiries come from MoToR BoatinG. There is a reason—Hall-Scott Motors are extremely high grade motors. They are just the sort for the best boats we have to-day—runabouts, cruisers, and racing craft. Hall-Scott motors have always made good in the very best boats—in the North, East, South and West. MoToR BoatinG reaches the owners and prospective owners of just these kinds of boats.

No expense is spared to make MoToR BoatinG the best boating magazine possible to produce. It has double the editorial contents and features in each issue of any of the other papers and its articles are of the kind the boatmen want—those boatmen who own real boats, powered with real motors.

In this same connection the Standard Gear Company of Detroit have just written us that 60% of their inquiries come from their ads in MoToR BoatinG and only 37% from all other boating papers in which they advertise.

The Paragon Gear Works of Taunton, Massachusetts, in a letter to a manufacturer who inquired for advice on marine advertising, stated, "We consider that on the basis of money expended MoToR BoatinG is the most economical producer of the boating papers." There are many such letters in our files.

MoToR BoatinG's circulation is another indication of the fact that we lead. Everyone knows that MoToR BoatinG has by far the greatest circulation. The figures of the Audit Bureau of Circulations, which audits the circulation of all prominent publications, shows that last year MoToR BoatinG's total circulation was 20% greater than that of our nearest contemporary and 70% greater than the circulation of the next nearest. In the matter of net sales on the newsstands MoToR BoatinG's circulation was 165% greater than the sales of the second paper and over 600% greater than the third.

And that is not all. During 1921 MoToR BoatinG's circulation has been going up steadily. Our March issue was sold out completely a few days after it went on sale. April sales were greater than March, May increased 7% over April, and June increased 5% over May. At the time of going to press the paid-in-advance orders for the July issue are even greater than for June.

MoToR BoatinG's Correspondence Course in Small Boat Handling, Seamanship and Piloting has been most generously received and has resulted in a gain of many new readers. Well over a thousand motor boat enthusiasts have enrolled as students and are writing out their answers to the examination questions each month. The high average standing shown in these papers indicates that we have succeeded in putting the complicated rules and problems of navigation into an unusually simple and easily understood form. The secret is in the wealth of illustrations used, by which we have made each rule a concrete situation.

Mr. Loomis' cruise from New York to San Francisco in the 28-foot yawl Hippocampus is also proving very popular. He has now reached the Gulf of Mexico and will soon be in waters which will assure our readers of some stories such as only Mr. Loomis can write. One installment of the cruise story by Mr. Loomis is appearing in each issue of MoToR BoatinG.

William J. Deed's series of plans and How to Build articles which are appearing as a complete article in each issue during 1921 are also very popular. We have arranged with John L. Hacker, the famous Detroit naval architect, to prepare for MoToR BoatinG a series of his celebrated designs during 1922.

MoToR BoatinG is published monthly by the International Magazine Company, William Randolph Hearst, president; Joseph A. Moore, vice-president and treasurer; Ray Long, vice-president; W. G. Langdon, secretary; 119 West 40th Street, New York City. Single Copies, 25 cents. Yearly Subscription in United States and Canada, $3.00. In foreign countries, $4.00. When you receive notice that your subscription has expired it is best to renew it at once, using the blank enclosed. When requesting a change of mailing address, give the old as well as the new one. Allow four weeks for the first copy to reach the new address. Copyright, 1921, by International Magazine Company (MoToR BoatinG).

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Milwaukee **Wisconsin**

"The Largest Builders of Express Cruisers in America"

Advertising Index will be found on page 118

MOTOR BOATING

119 West 40th Street, New York, N. Y.

The skipper sitting on the boom in Charleston Harbor

Head Wind and Showers of Rain

The Sea Going Yawl Hippocampus Makes Slow Work of Her Cruise to the Golden Gate, But Her Crew Enjoy the Stops in Port

Third Instalment of the Story of the Cruise of Hippocampus from New York to San Francisco being Published Exclusively in MoToR BoatinG

By Alfred F. Loomis

ONE of the most sea-going authors of the present day has written recently of the poetry of the night, the soft swish of the waves on the ship's bow, the occasional dash of spray (like nectar on the lips), and of how all these concomitants of a lazy midwatch put one in tune with the universe. Brandishing aloft this eminent authority's story (which appeared in a similarly named contemporary) I asked my valiant crew what they thought of during the graveyard watch. Subjoined are two veracious statements:

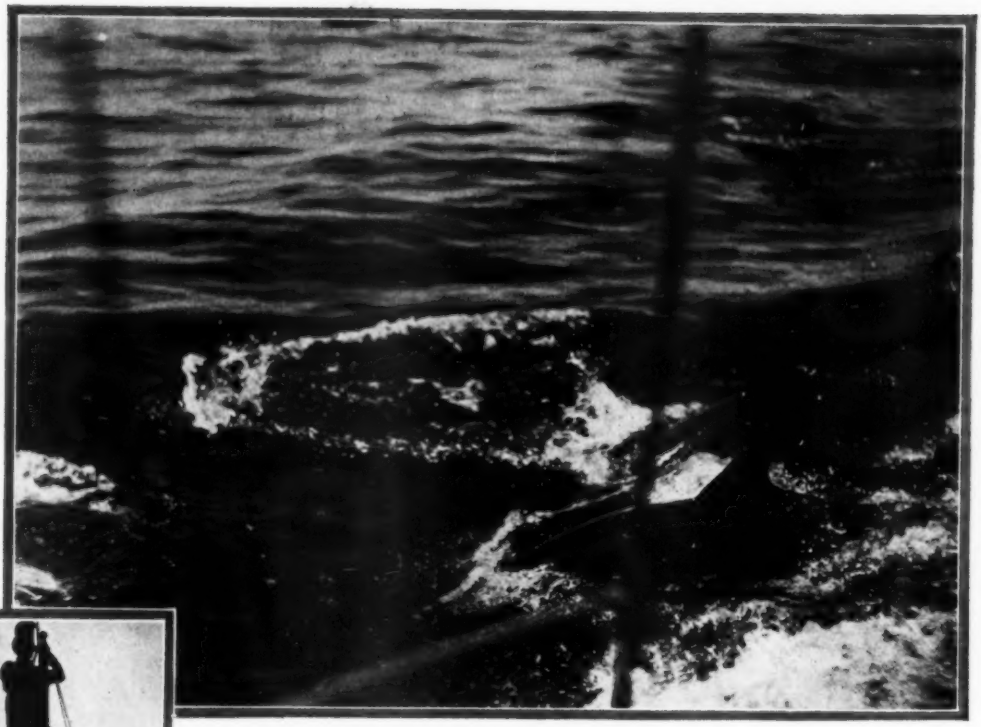
Statement of "Joe" Squibb, ex-Artilleryman

"When I have the trick at the observation post and you fellows are sleeping in your funkhole, I wonder what makes the flying fish fly. That starts me to speculating on how a swarm of houseflies can overtake a ship two days or fifteen miles from port. In such cogitation I feel loath to call my relief, even after I have stood the middle and part of the morning watch and have refilled all the lamps and mopped up the floor before getting breakfast."

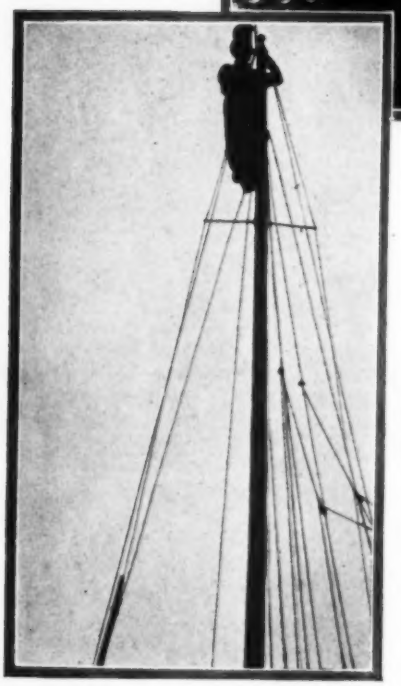
Statement of "Joe" Chambers, ex-Sub-Chaserman

"When I have the deck all the pleasant images of a well-spent life pass in review before my closed eyes. I cork off peacefully, while Marblehead, Bensonhurst, Ponta Delgada, Santo Domingo, and the malaria ward at the Key West Hospital fight for my comatose attention. But when the stormy petrels start twittering around the logline I snap out of it, put on my oilers, lash the barometer to keep it from falling any lower, and prepare for a wicked night. I have never yet stood a lazy midwatch."

As for me, I marvel not at the immensity of the universe



Large porpoises accompanied us for many miles



The skipper greases the throat halyard block although it looks as if he were sighting land

and all the little stars buzzing dizzily across the firmament, but dally my thought with the slothfulness of time. At 12:05 I look at my wirst chronometer and find that I have two hours and fifty-five minutes to stand before calling Joe to tell him that it is raining violently and blowing a gale from the northeast. At 12:10 I find that I still have two hours and fifty minutes to go—and so on. And my subconscious mind continually asks me why I elected to do this sort of thing in preference to sleeping comfortably at home in a bed. So the watch proceeds.

But the mention of the stormy petrels in Chambers' statement has reminded him of a story which must be repeated here before the answer to my subconscious questioning is woven into the log of Hippocampus. Al is an imaginative raconteur, and if ever we lie becalmed for a month one chapter at least of Hippo's cruise will be devoted to his probable stories. The one about the stormy petrels takes us back to the bold, bad days of the 11th squadron of sub-chasers.

He had just been commissioned and assigned to command SC-63. As he stepped aboard preparatory to accompanying a fourteen-knot convoy to sea, his eyes fell on the wilted, weazened form of a warrant boatswain who had spent the last forty years of his naval life on shore station. The warrant piped up in a quavery treble, "I have been ordered to accompany you on this convoy to make you sea-going. You will remain in command, but I will stand by to give you the benefit of my experience. You may shove off."

So they shoved, and before long the chaser had cleared Ambrose and was out on the billowing Atlantic. And before long the warrant was in possession of the skipper's bunk, much troubled in mind and stomach. Throughout a long and stormy night the chaser stuck with the convoy, and Chambers kept the deck, and in the morning reversed his course and stood back to New York. Then he went below and awakened the warrant from a fitful slumber.

With palsied hands that experienced sea dog raised his face to a port-light, looked through it at the tumbling waste of waters, and cried in a piteous falsetto, "My God, we're at sea—we're *at sea.*" Then, catching sight of a covey of stormy petrels, he turned his woebegone face to Chambers and added, "And them birds ain't following us to no good purpose."

So it has been with Mother Carey's chickens since the outset of Hippocampus's expedition. They've followed us to no good purpose and they have brought enough foul weather to establish the name and fame of any young Joe Conrad who, on reading these lines, cares to ship with us for the remainder of the cruise to Frisco. We can promise him more of the same with an occasional calm thrown in to vary the monotony.

Before leaving Norfolk on May 12 I interviewed the Weather Bureau—my first and only crime of that nature—and learned that an ominous low was developing over the Middle West and that fresh to strong southeast winds might be expected for several days. So I returned aboard and put the matter up to the crew. We might go inside Hatteras, burn a lot of gas, travel only by day and go aground in Pamlico Sound, or we might run outside and take what the Weather Bureau thought it had promised us.

Hence we chose the lesser of two evils and that afternoon dropped down to Lynnhaven Roads, there to anchor in quiet water in the lee of Cape Henry. We figured that if the wind did blow from the southeast we would have a snug berth, and if it blew from another quarter we could

Squibb washing while Chambers starts his breakfast while under way

up anchor and away. Friday the 13th dawned fair with just a suggestion of a southeast slant, and, after stowing a breakfast where it would do the most good, we stood out between the Virginia capes, dipping our colors to an overtaking T-boat. Our first tack carried us past the sea buoy, ten miles to eastward, and put two fishing schooners behind us, and the next reached us down the coast, a matter of five miles and within two miles of the beach before we again put about and headed for sea.

So, fighting a contrary slant of wind, we spent the day, and by nightfall had picked up Currituck Light and made good less than twenty miles. With the change of watch shortly after midnight came a squall of wind and the only excitement of the run to Beaufort. In lowering the mainsail to meet the squall, the mast hoops, which had become elongated through much use, stuck, and we consumed exactly as many moments in stays as were needed to carry the foot of the jib away from the boom lacing. It then became my pleasant diversion to divest myself of oilers, pea coat, and other essentials of a cruise to the Tropics, and lay myself along the bowsprit. Thanks to the jib downhaul which Al had rigged two days before, the torn jib came down easily and it was a matter of only half an hour, working by the sense of touch, to unbend the old sail and bend on our storm jib. Inasmuch as the sea water was warmer than the air I have taken worse duckings than the little Hippo gave me as her "sky-jabbing bowsprit" reversed the motion and immersed itself and me.

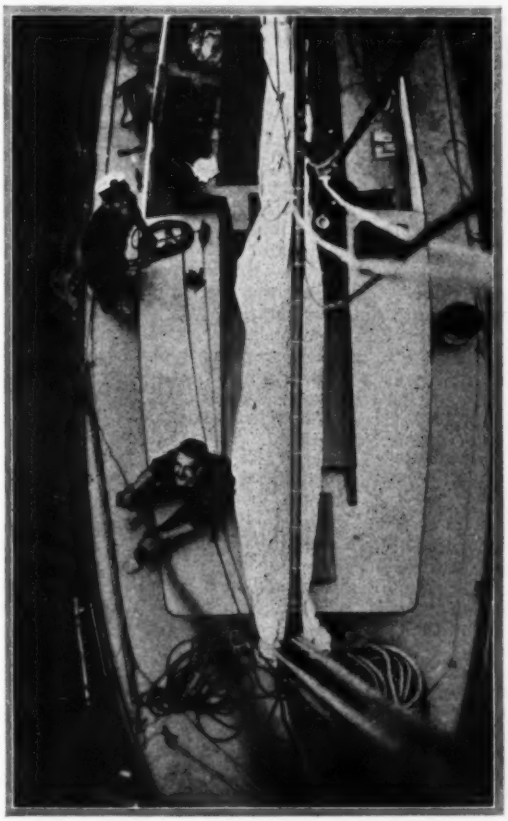
Under her shortened suit of sails Hippocampus proved unwilling to come about when, with the storm jib filling, we tested it out. But we thanked whatever prudence we possessed that had put us fifteen miles from a lee shore before the squall struck; and being then on the port tack, headed back to Virginia. Paul, on the three-to-six watch, reported violent showers of rain with little wind, and at 6 o'clock it was unanimously voted to start the motor and ease the motion of the craft. The Palmer voted Aye along with the rest of us, kicking off merrily after a spasm or two, but the go-ahead position of the reverse registered a No, and it was eight o'clock before we had achieved an adjustment that would not slip when the propeller, after a short run up the back of a wave for a breath of air, returned to deep water.

An hour later we sighted Currituck on our beam and learned that twelve hours of tossing about had netted us less than five miles of southing. Finding that the jib and jigger remained filled with the motor working to reduce the sideslap we raised the mainsail, but it wasn't many minutes before the southeast wind gave the lie to the Weather Bureau and puffed out, never to revive sufficiently to give us steerage way until we had rounded Hatteras and Lookout and were finally anchored securely off the entrance to Beaufort Harbor, N. C.

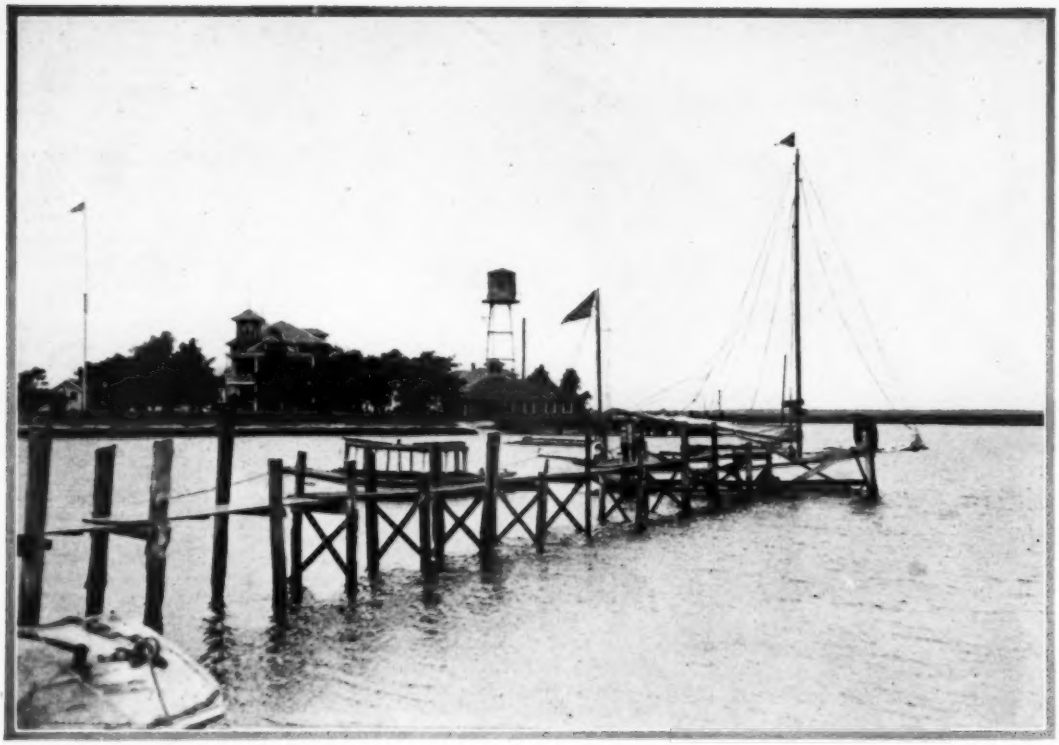
All day of Saturday the 14th we plugged along under power, being convoyed by a school of seventy-five to a hundred porpoises, and at nightfall when we picked up Wimble Shoals buoy the sea was calm and Hatteras had lost its power to alarm us. That night we recorded in the log the most vivid display of northern lights that we had ever seen, and concluded that Old Man Hatteras, being temporarily out of breath, was doing what he could to make our passage interesting. Yet we mentally noted that sentence in the Coast Pilot which relates that "two or three wrecks may usually be seen on the outer shoals."

Paul, standing his usual rainy watch, brought Diamond Shoals Light-vessel abeam just before daylight, and we squared away for Cape Lookout. The Sabbath was an uneventful repetition of Saturday, except that in midafternoon, desiring to test the action of the boat under jib and jigger alone, we declutched and spent the next two hours in the bilge gazing blasphemously into the innards of the reverse gear.

Eventually it took hold again in the go-ahead (and in justice to it it has given us no trouble since), but the time lost reduced to nothing our margin of daylight which we had hoped would take us through the inner channel of Cape Lookout Shoals; so with darkness and the customary heavy rain we shaped a course for the southern tip of the shoals and prepared for another night of it. By this time the apple pies of Mrs. Frederick Lewis of Norfolk (a stranger on our arrival there, but a most hospitable hostess before our departure) had gone the way of all transcendently delicious pastry, and we were anxious



The forward deck of Hippocampus as it appears from the masthead



Hippocampus lying at the dock in Beaufort, N. C. The Marine Biological Laboratory in the background

to make port and surround a chow cooked under favorable circumstances. But Old Man Hatteras, to whom we had thumbed an impudent nose, hadn't finished with us.

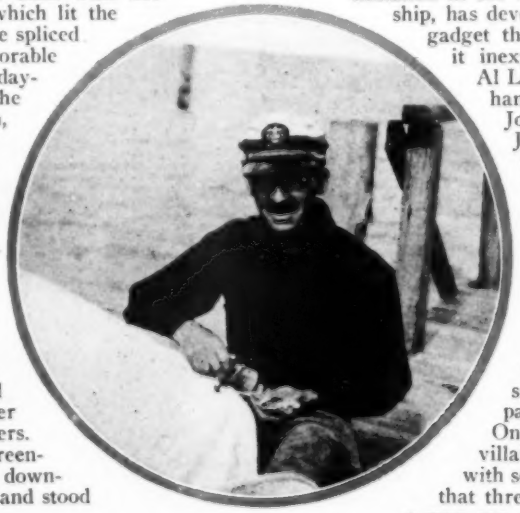
He sent dizzy showers of rain which obscured Cape Lookout Light and sent us on a long detour around the shoals for safety's sake, and at 12:30 of the morning of May 16th as we picked up the lighted buoy at Beaufort entrance, he drained the last drop of gasoline from our starboard tank and brought us up short. Knowing that there was less than a gallon left in the port tank we nonchalantly let go the hook in eight fathoms of water, extinguished running lights and lighted the rider, and turned in for some much needed shuteye.

Lest we be criticized for anchoring in the open ocean let me explain that it is my first offense and that the action was justified. The sea was flat calm with not enough air to flutter the match which lit the riding light. Before turning in we spliced the main brace, drinking to a favorable slant of wind with the coming of daylight, and Squibb, who had had the watch below from eight o'clock on, slept with one ear open.

At five-thirty he awakened us with the pleasing news that a breath of air was stirring from the southeast, and, getting under way with all sail set, we made for Beaufort Inlet. Following the buoys, but with the lead in play, and with Al's cunning hand on the tiller, we passed between the breakers and thanked the little god of gasolinedom that our starboard tank had drained when it did and not three miles later in our voyage into turbulent waters. Then, bucking an ebb tide and screening the chart from the matutinal downpour of rain, we rounded the bell, and stood up the harbor.

But the wind, wearied of its well doing, left us, and when less than a mile from the wharves we started the motor on what there was left in the port tank. It carried us to within four hundred yards of the gasoline dock and there the last drop followed the preceding sixty gallons out of the exhaust pipe, and we came to anchor. Undismayed, we squeezed another carbureterful from the starboard tank, emptied the priming can, and were experimenting with kerosene and rain water when a kindly gentleman of the African persuasion towed us to the wharf for value received. Having tanked up we dropped around a point to another wharf where we secured for a feed and a rest.

Let us here leave Hippo for a moment, her hatches battened against an all-day shower of rain, and get a more intimate slant at her personnel and organization. As previously implied, we have Al Chambers, sailing master and narrator extraordinary, and Paul Squibb, who, since his initiation in the famous battle of Fenwick Lightship, has developed into the most ocean-going gadget that ever trod a deck. He found it inexpedient to say Al Chambers or Al Loomis when calling the respective hands to chow, and so calls us both Joe. Naturally enough, we call him Joe, and there is now a complete unanimity of nomenclature aboard the yawl. Mistakes are impossible and profanity is useless.

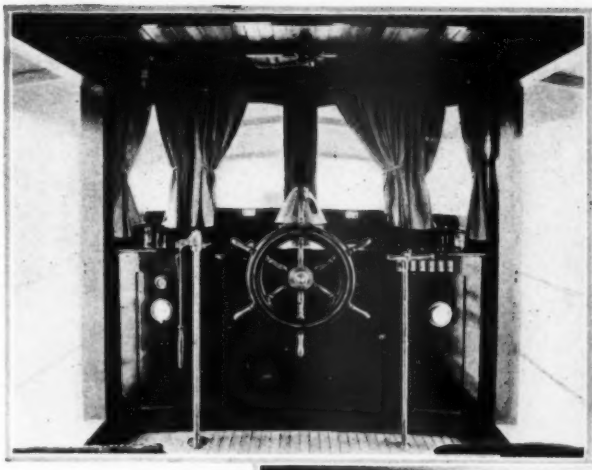


Chambers bending the new jib to the boom

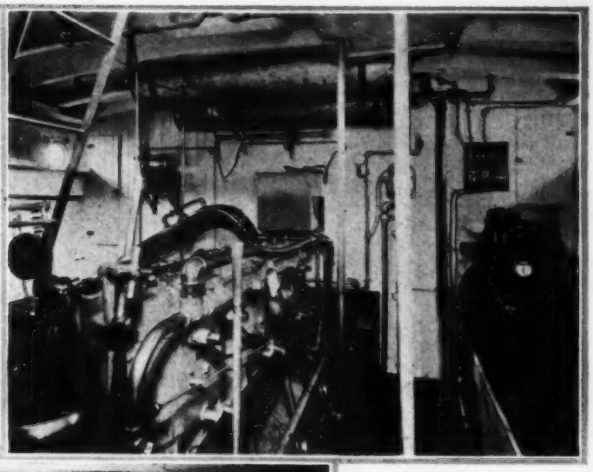
Underway, Chambers usually has the first watch from port while the skipper lies below and gets used to the motion of the craft, and Squibb wrestles with a meal. After that the dishes wash themselves in the rain and the skipper takes a trick at the stick while the crew cork in anticipation of a stormy night at sea. Once darkness has fallen out of a villainous sunset the watches come with some regularity and we have found that three hours on deck is about all that a man can encompass with ease.

The day after leaving port, when the seas are running high, two meals are thought sufficient

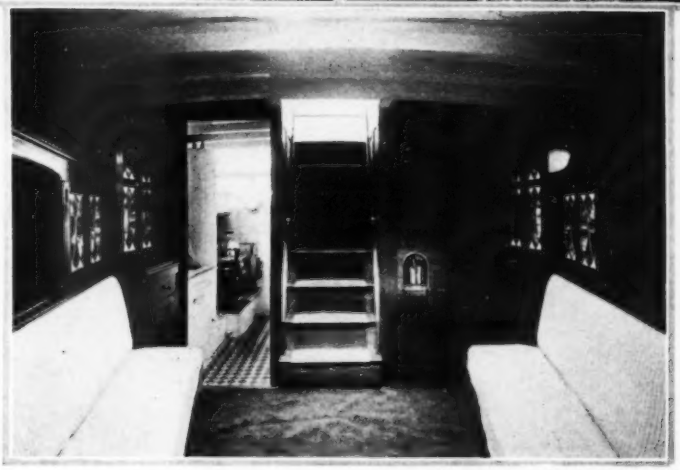
(*Continued on page* 58)



Bridge deck, showing how all the engine controls are centrallized



The engine room contains the six-cylinder Winton gasoline motor and the Delco auxiliary electric set



Main saloon of Amiejean with galley in the background

A characteristic of the boat is the ample light and ventilation

Photographs by Edw'n Levick, N. Y.

Amiejean, A Big 70-Footer

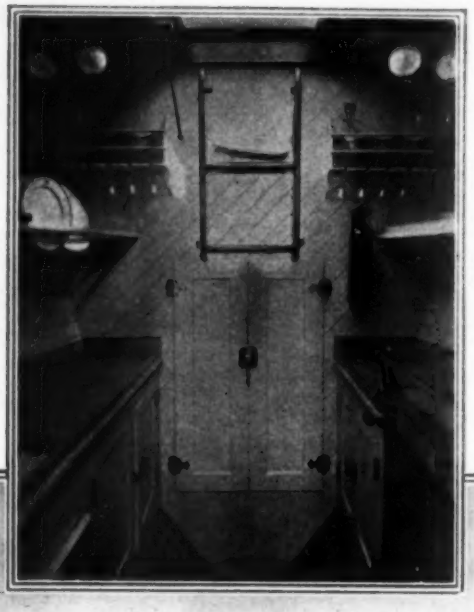
An Unusual Boat of the Flush-Deck Type Designed for Extensive Deep-Water Cruising

The seventy-foot cruiser Amiejean designed by F. S. Nock

AMIEJEAN, owned by E. P. Lawson, New York City, designed and built by Frederick S. Nock, is rather an unusual type of cruiser for her length, as she is a flush-deck craft with a deck-house practically amidship. The arrangement of the interior was worked out to the owner's ideas. The dining saloon in particular being very complete. A table which will easily accommodate nine persons is provided. On each side, there are lockers and buffet with sideboards at the after end. China and glass lockers are also plentiful. At the after end of the saloon, there is a companionway leading to the deck and also the entrance to the galley.

The galley runs the full width of the boat and is conveniently arranged. On the starboard side are a sink, boiler, range and dish racks; at forward end under the companionway, there are a number of zinc-lined drawers for meal, flour, sugar, dry groceries, bread, etc., and to port of these lockers, a refrigerator capable of storing about 750 lbs. of ice, and aft of same along the port side, a dresser and lockers for storage of provisions. The range, a Shipmate, is equipped with kerosene oil burner, plate warmer, heater, oven, etc.

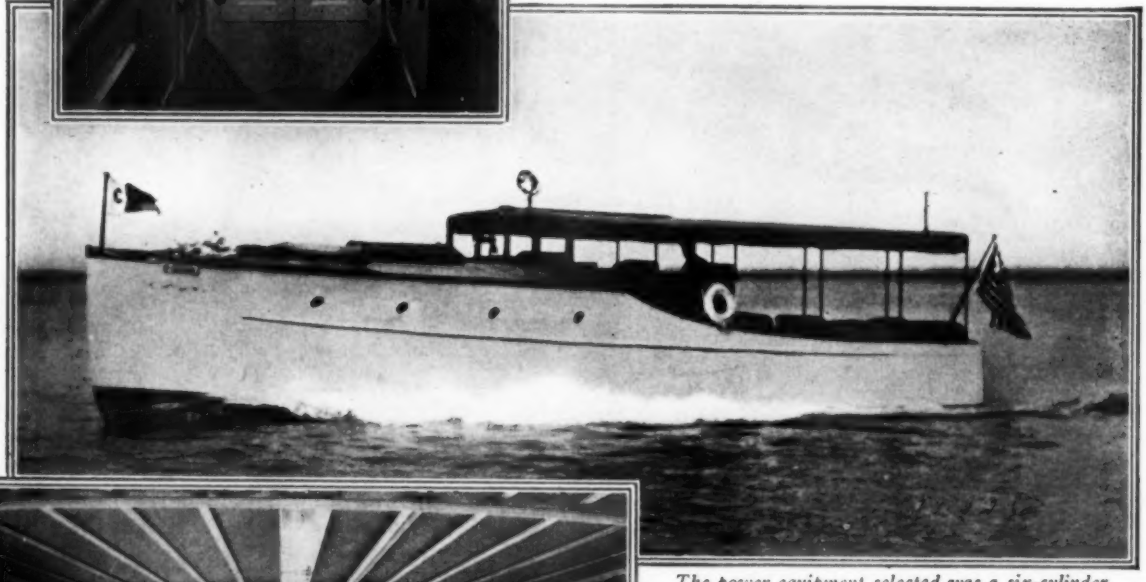
The engine is a Winton gasoline of the six-cylinder type which is controlled from the deck-house steering stand. Delco electric light generator and batteries furnish auxiliary power. The gas tanks, of over 600 gallons capacity, are situated at the after end of the engine room.



Tobasco II, built by the Great Lakes Boat Building Corporation of Milwaukee for Mrs. Newton Chapin, was one of the popular boats at Miami last winter. This 40-foot day cruiser is wonderfully equipped and furnished. A complete galley forward is followed by the main cabin and roomy cockpit

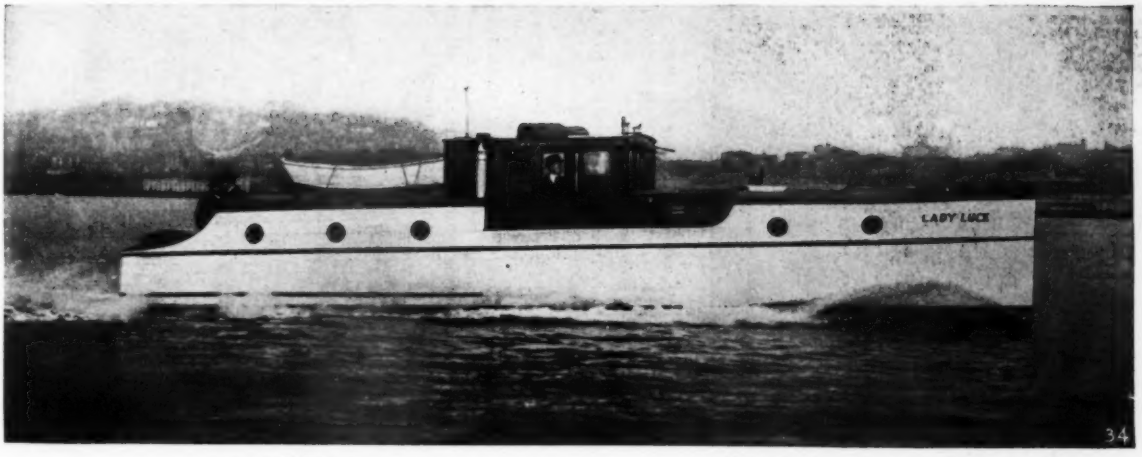
Tobasco II, a Day Cruiser

A Cruiser Representing the Latest in Design and Construction Which Has Just Been Completed



The power equipment selected was a six-cylinder Van Blerck engine that gives the boat a speed of 20 m.p.h. which is excellent in view of the heavy construction with one-inch planking. All controls are carried to the bridge deck for one-man operation

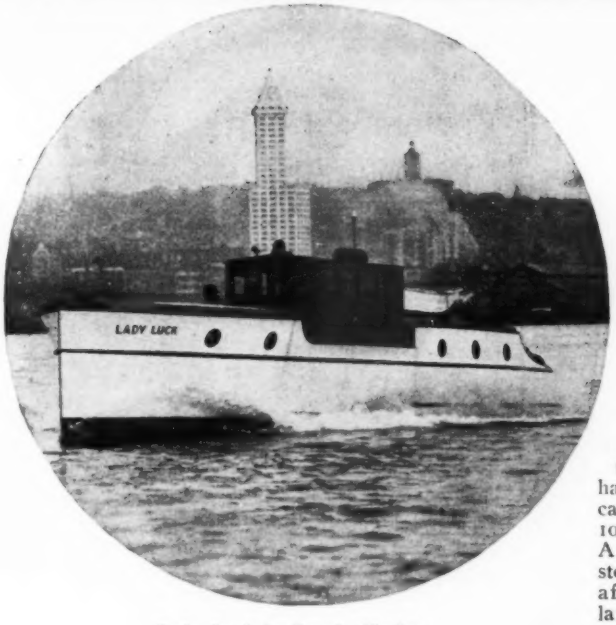
Mahogany has been used throughout the boat for trim and all joiner work has been constructed of this wood. The interior color scheme involves the use of gray French broadcloth with blue Wilton carpets to harmonize with the mahogany interior



Lady Luck, a 42-foot express cruiser

Lady Luck, a Seattle Cruiser

An Express Cruiser of Unusual Design, to Serve as a Combined Pleasure and Business Craft



Lady Luck in Seattle Harbor

AMONG the new boats developed on the west coast of the United States is the express cruiser Lady Luck. She was built for S. V. B. Miller of Seattle by the Bezanson Boat Building Company. In her 42 feet of length are located ample quarters and comforts for four persons with provision for a crew of one. A chain locker is forward, followed by a cabin provided with berths and dressers with a separate hatchway. The engine room is next and houses two six-cylinder Scripps motors which drive twin screws and give her a cruising speed of 14 miles per hour. An unusual feature is the full headroom in the engine room. The bridge deck has been kept high enough to provide this convenience which is greatly appreciated.

A passageway is provided between the motors to permit access to the after quarters. All controls for both motors are brought to the enclosed bridge and the boat handles from there. Storage batteries of large capacity are carried in lockers on either side of the engine room. Two 100-gallon fuel tanks are also carried under the bridge deck. A comfortable galley amidship is well equipped with a coal stove, lockers and other essentials. A large main cabin is aft, fitted with spring berths, underneath which are the large fresh water tanks.

The interior work of the boat is natural Port Orford Cedar finished with Valspar, while the bridge enclosure and outside trim is mahogany.

Her owner uses the boat for business purposes in getting about among the various industries of Seattle and Alaska. Her speed and ability as a sea boat enable him to make these trips whenever necessary.

Lady Luck has a cruising radius of about 400 miles and some interesting cruises are planned for the coming summer. The twin-screw installation simplifies the handling of the boat to a remarkable extent and it is possible to stop and turn completely about in little over the boat's length.

There is an absence of fuss in the wake

The crew—not in name alone either—all sailors who know the taste of sea water as well as that of the great inland waterways. Left to right, Esther Wood, Mrs. Gar Wood, Commodore Gar Wood, George Wood, Logan Wood—and there are seven more Woods at home—all good sailors

Although each lock holds hundreds of thousands of gallons of water, yet it enters with little disturbance and without any danger to motor craft

Gar Jr. II Reaches Detroit

The Last Leg of the Record Breaking Run of the Famous Speed Cruiser from Miami, Fla., to Detroit, Mich.—Two Thousand Thirty Six Miles without Engine or Hull Trouble

IN the last issue of MoToR BoatinG we told of the wonderful trip of Gar Jr. II from Miami to New York, most of which was made outside in the ocean in weather far from the mill-pond variety. We pointed out what a magnificent sea boat Gar Jr. II proved herself to be and how the two Smith Marine Twin Six Motors stood up for the entire run of 1,257 miles to New York without even an adjustment of a minor part or accessory. We showed that sailing on Gar Jr. II at sea was comfortable and safe and that the boat could be readily and easily navigated in a seaway even at speeds in excess of 30 miles per hour.

Now we come to a part of the trip which many had prophesied would be uninteresting and a bore after the thrills take many generations to dilute it. This was some crew. The four original salts worked well together; but the rhythm with which the new crew worked was beyond all description. There wasn't a jar or a jolt, literally or figuratively, any time or anywhere. Even Gar had to admit that in the galley he was now outclassed. While we had dined like princes at sea, yet it didn't hold a candle to the meals which were served on this leg.

Those that believe that Gar Jr. is not a cruiser should have been along. Never were we sleeping less than seven aboard and could have accommodated more comfortably.

It was after 2 o'clock in the afternoon when we slipped our mooring at the Columbia Yacht Club and headed north toward Albany. Most cruisers in making the run to that city get away by daylight if they hope to make the 138-mile trip all in one day, but that wasn't necessary with Gar Jr. The cruiser record from New York to Albany was made by Flyaway III, owned by Thomas B. Taylor, in the race of the New York Motor Boat Club in 1915. Flyaway's time for the up-run was 5 hours 43 minutes, but she had a favorable tidal current with her all the distance while we got away at the last of the ebb, and

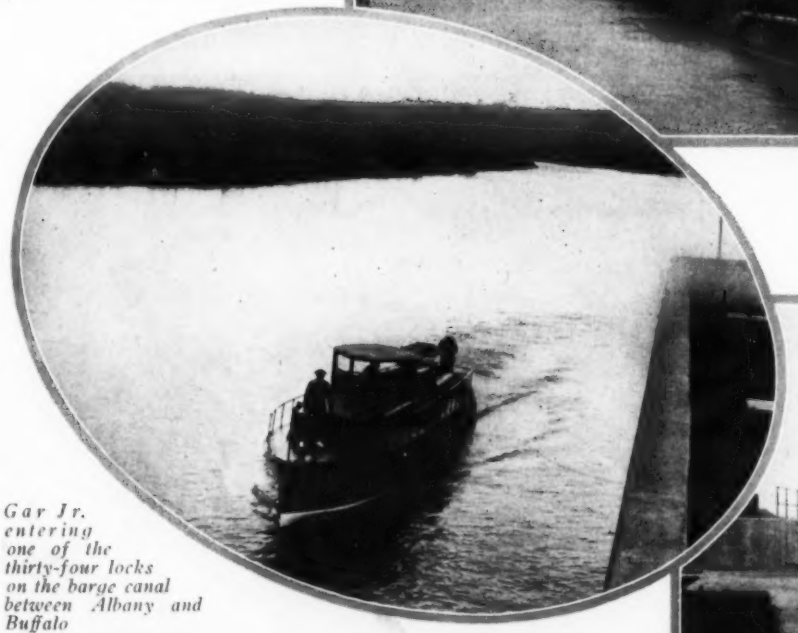
(*Continued on page* 106)

prophesied would be uninteresting and a bore after the thrills at sea. Navigation on the Hudson and on the Erie Canal between Troy and Buffalo was pictured to the crew of Gar Jr. as being slow and tiresome. We were told that a speed of 6 miles an hour would be the maximum, and, when it is remembered that the cruiser has a record of 41.8 miles per hour made in the Florida races, we'll admit the prospects were not encouraging. But here again the old-time

Made fast in a lock waiting for water

One of the two locks at Lockport, the western end of the canal, where there is a lift of 69 feet

Most of the locks were ready for us, as our approach was known to all the lock tenders. There was a delay of only 8 to 15 minutes in each lock

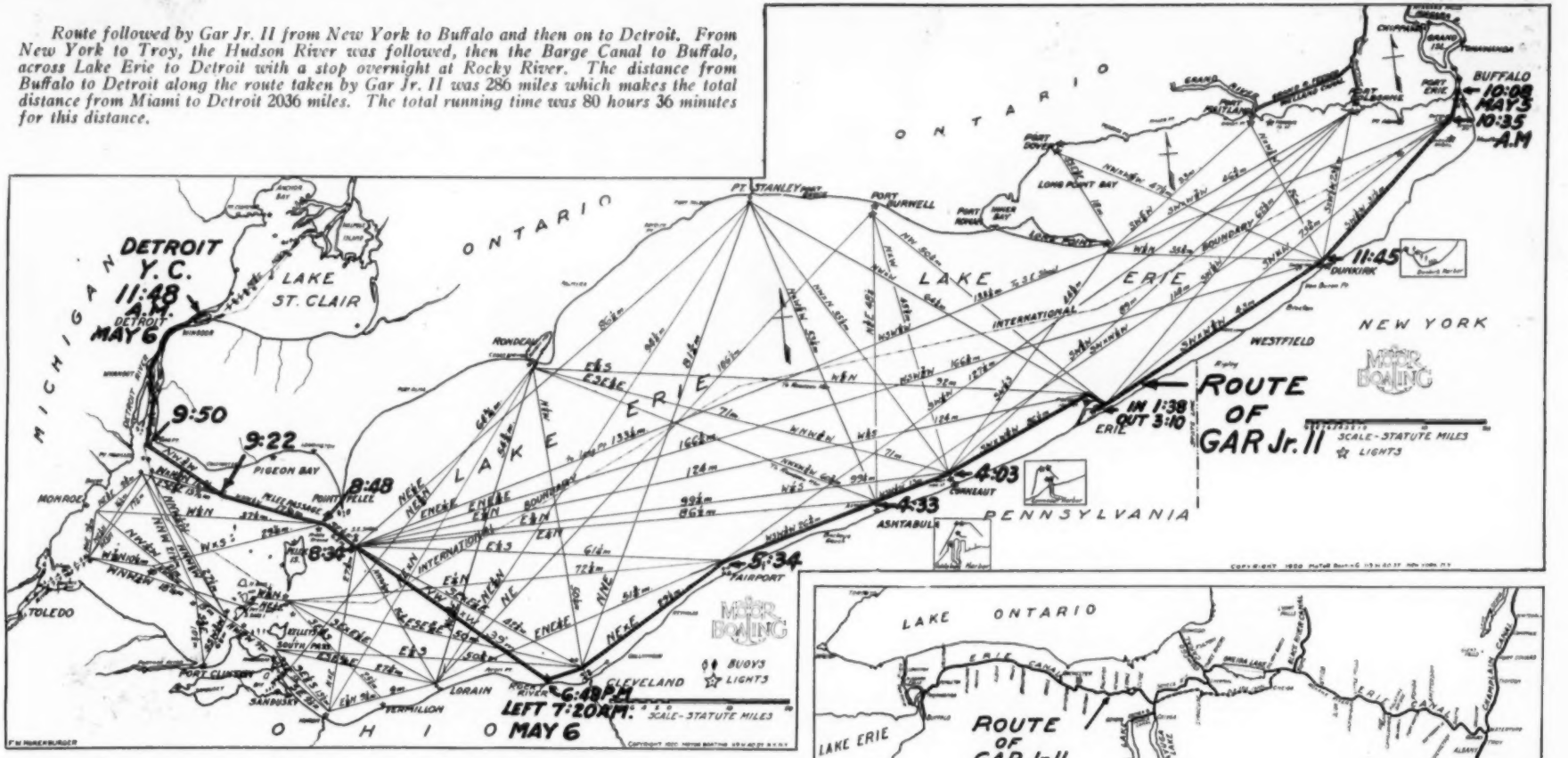


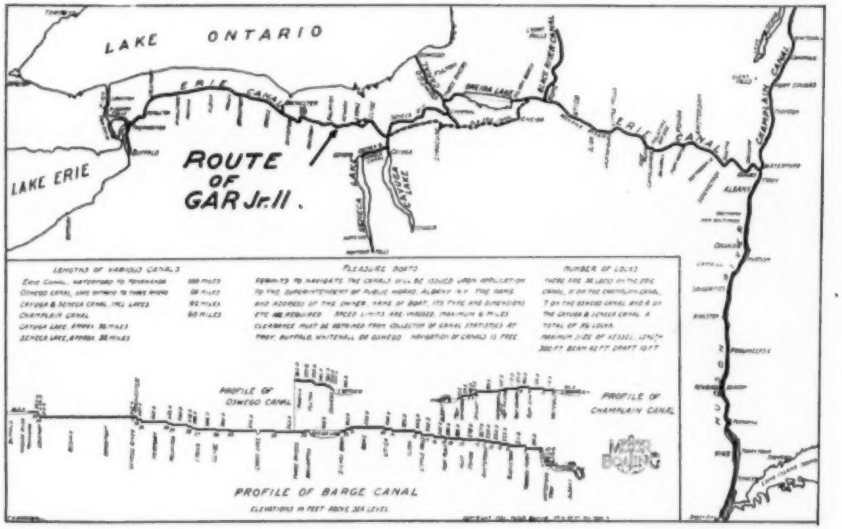
Gar Jr. entering one of the thirty-four locks on the barge canal between Albany and Buffalo

honored dope all went wrong, for the run the entire distance from New York to Detroit was interesting and not a minute lagged.

The crew of Gar Jr. II was considerably increased at New York. Captain Post, whose expert advice on anchors and anchoring had been so valuable on the run up the coast, now left the ship and proceeded overland to Detroit, as he said the Gar Jr. II was safe from the tempestuous seas and could tie up at any tree or at any barnyard that happened to be near when nightfall overtook the speeding craft. Mrs. Gar Wood as well as two of Gar's brothers, George and Logan, and Miss Esther Wood signed on. It was easily recognized that a love of the sea was born in the Wood family and has so firmly planted itself in their blood that it will

Route followed by Gar Jr. II from New York to Buffalo and then on to Detroit. From New York to Troy, the Hudson River was followed, then the Barge Canal to Buffalo, across Lake Erie to Detroit with a stop overnight at Rocky River. The distance from Buffalo to Detroit along the route taken by Gar Jr. II was 286 miles which makes the total distance from Miami to Detroit 2036 miles. The total running time was 80 hours 36 minutes for this distance.





The Run From Buffalo to Detroit by Gar Wood, Himself

EAGAN'S boat house to Rocky River 189 miles—7 hours 8 minutes—35 mile NE wind—heavy sea all the way.

There was a following sea and we had a fine ride—ladies on deck all time. Too rough for meals so we put in at Erie for lunch. Tug men told us it would be bad to Cleveland but we found the going met with the approval of the old ship and not bad at all. Were entertained at Cleveland by Mr. and Mrs. Com. Parsons and Mr. and Mrs. Com. Roberts—fine time.

Run from Rocky River was smooth and we turned engines about 1,275 r.p.m., arriving too early at mouth of Detroit River. We were scheduled at Detroit Yacht Club at twelve o'clock so waited at Amsherstburg until eleven.

Big demonstration of whistle blowing up entire river and met by large delegation at Detroit Yacht Club—two receptions followed. Every one pleased with records and grateful to you for your able co-operation and fine sportsmanship.

Photographs by International

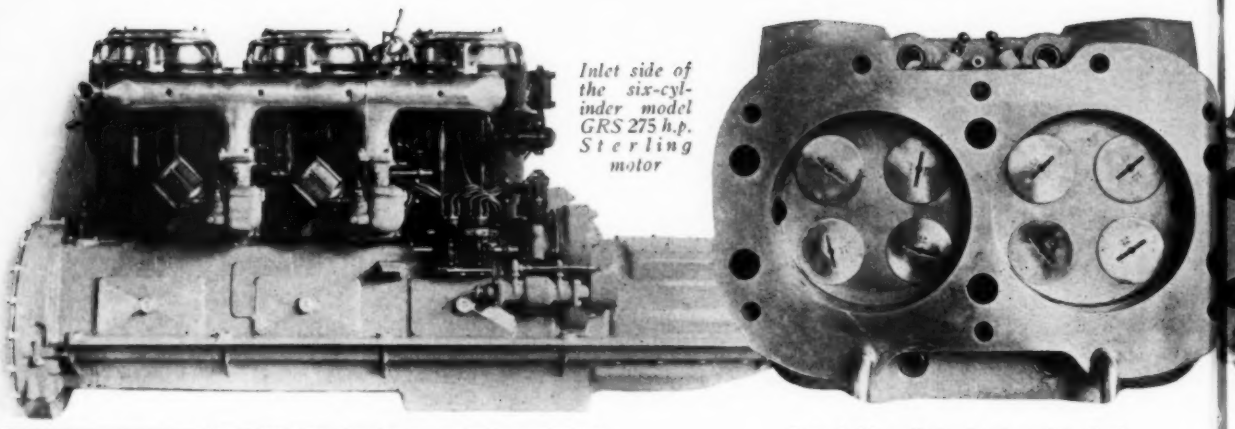
George Leary, Jr., of New York, the owner of Orlo II, and Claude Graham White, the English aviator who is having a special 42-foot Sea Sled fitted with a pair of powerful Rolls-Royce engines. A special design has been prepared for this boat by Albert Hickman, and it is expected that a speed of 50 m.p.h. will be attained. The Sea Sled's ability to carry large loads at high speeds in rough water is only one of its characteristics

Orlo II, A Notable Sea Sled

The Holder of the World's Record for Displacement Boats Is Used for Other Than Racing Purposes

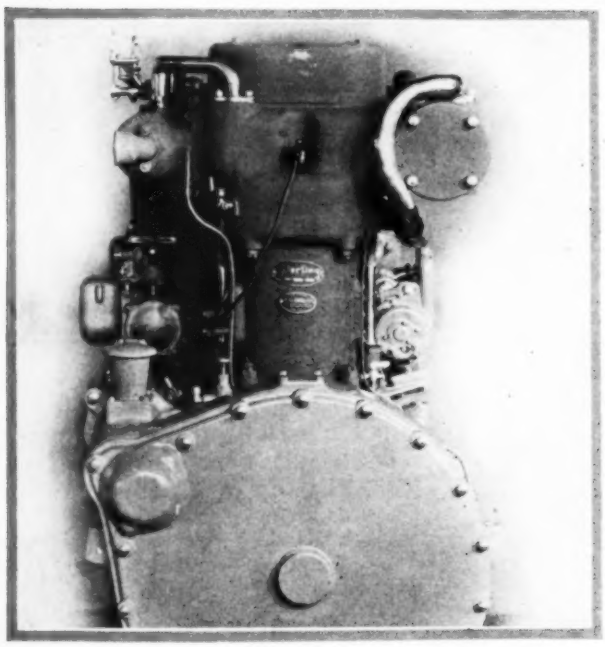
Orlo II, the Sea Sled owned by George Leary, Jr., and designed by Albert Hickman, which broke all records at the Florida races. On a weight of 26 pounds per horsepower a speed of 47 m.p.h. was attained in competition. The power equipment installed is a pair of six-cylinder GR Sterling motors

A party of guests being entertained in the Sea Sled. Left to right, front row—George Leary, Jr., Miss Louise Branch of Richmond, Va., Miss Helen Murphy of Troy, N. Y., Miss Constance Peabody of Beverly Farms, Mass., Miss Frances Brainerd of New York. Second row, left to right—Frederick Proctor of New York, Miss Virginia Bennett of Denver, Colorado, Claude Graham White of London. Third row, left to right—Harold Osgood Whitney of Boston and Carl Deakin

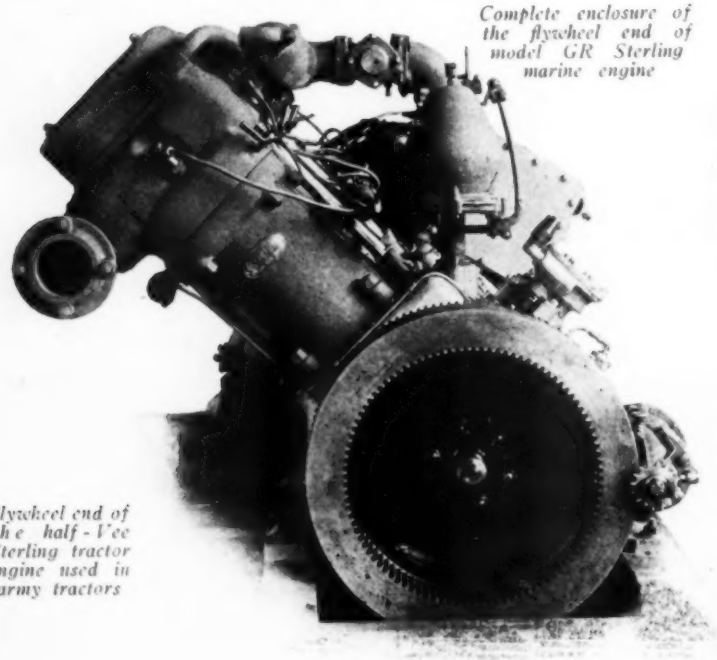


Inlet side of the six-cylinder model GRS 275 h.p. Sterling motor

Detachable cylinder head used in dual valve high-speed service



Complete enclosure of the flywheel end of model GR Sterling marine engine



Flywheel end of the half-Vee Sterling tractor engine used in army tractors

Refinements in Mar ine

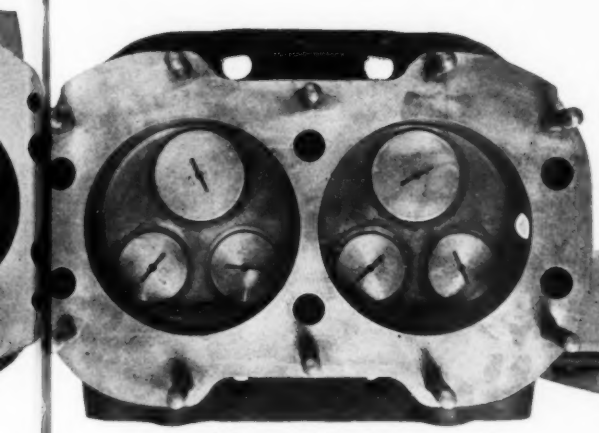
Notable Progress in the Development o High ine Motor a Leading Place i the

DEVELOPMENTS in gasoline engines during the past few years have been rapid and it is interesting to note that the marine industry has forged to the front with motors so far advanced that it is generally recognized in allied industries. The United States Army has adopted marine engines for its heaviest highspeed work and some notable performances resulted. Thirty-ton caterpillar tractors, mounting six-inch guns, are being equipped with the Dual Valve, Six-Cylinder Sterlings, and are being driven at high speeds, miles faster than before.

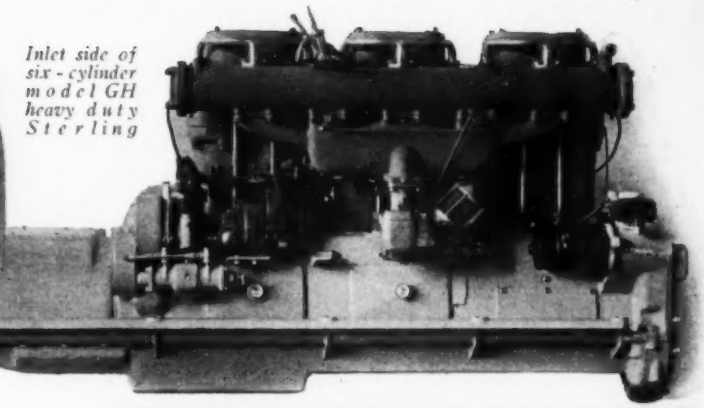
The motors are super-powered, being an adaption of the Sterlings, which have established many marine records the past two years. The bore is 5¾ inches, stroke 6¾ inches, the four-cylinder motor being rated 150 h.p. at 1,500 r.p.m. and 185 h.p. at 1,950 r.p.m. The six is rated 225 h.p. at 1,500 r.p.m. and 275 at 1,950 and the eight 300 h.p. at 1,500 r.p.m. and 365 h.p. at 1,950, the actual development being far in excess of the rating. The motors have been turned above 2,000. These are America's most efficient marine engines and they rank with the first few highly efficient gasoline engines in the world. The four-cylinder motor weighs eight pounds per horsepower, the six about six and one-half, based on top power.

An example of what has been accomplished is well brought out by comparison with the 12-cylinder Liberty motor of 5-inch bore, 7-inch stroke of 450 h.p. Two 6-cylinder Sterlings develop over 550 h.p.—in fact, close to 600. Checking known gasoline consumptions: two 12-cylinder Liberties in a 50-footer used 1,800 gallons of gasoline and 200 gallons of oil in 1,260 miles, averaging 26 miles an hour. Two 6-cylinder Sterlings in the Great Lakes 54-foot express cruisers at 26 miles an hour consume in 1,260 miles about 1,200 gallons of gasoline and about 48 gallons of lubricating oil.

In marine practice, naturally, the high-speed motors are not adapted to heavy boats, so a series of heavy duty motors are built for speeds of 200 to 800 revolutions, using the same connecting rods, crankshaft, camshaft and various other portions of the motors. The



Detachable cylinder head used in heavy duty Sterling motors



Inlet side of six-cylinder model GH heavy duty Sterling

ine Motor Design

High Speed Engines Has Given the Mar- the Automotive Industries

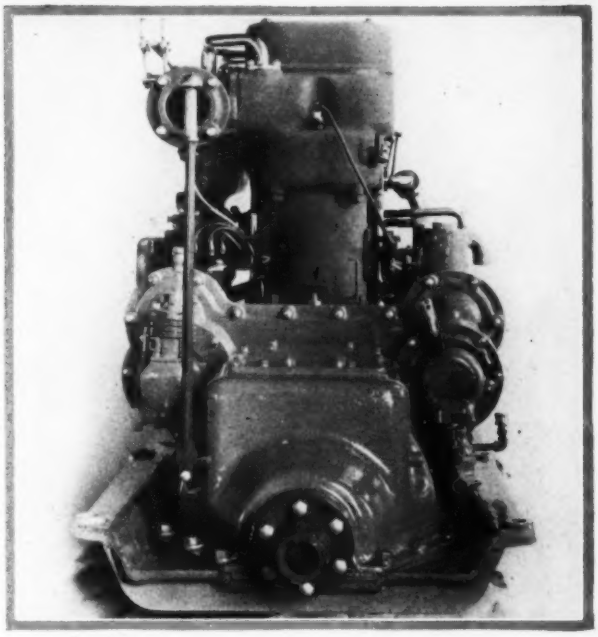
parts which are capable of holding over 185, 275 and 365 h.p. at engine speeds up to 2,000, in the high-speed 4-, 6- and 8-cylinder engines, are required to hold only 63, 94 and 126 h.p., respectively, in the heavy duty motors.

There are important changes in design also to facilitate flexibility and economy at lower engine speeds. Compression is lower and, while the higher speed models use two intake and two exhaust valves in a detachable cylinder head, the heavy duty engines employ one inlet and two exhaust valves. The arrangement enables the mounting of both inlet and exhaust manifolds on the same side of the engine. The two manifolds are bolted together and hot exhaust gas is maintained in the jacket of the inlet manifold.

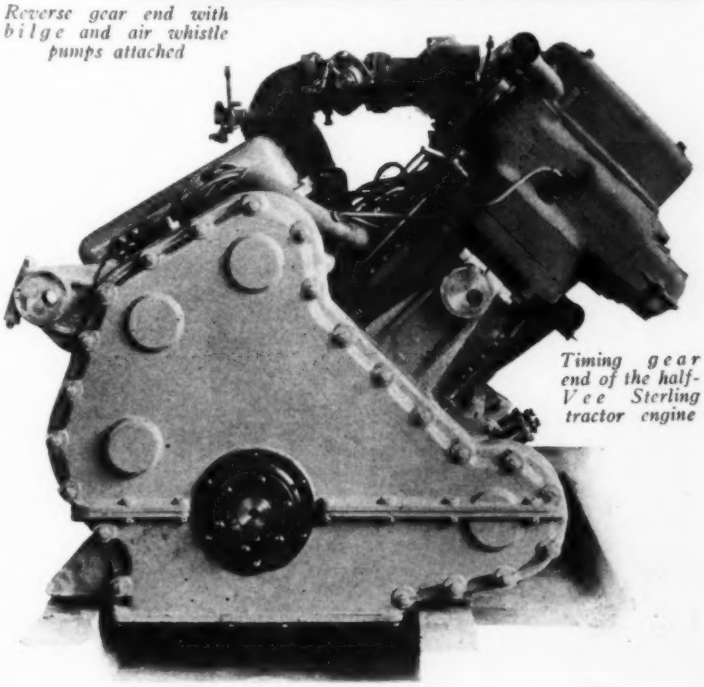
The amount of heat allowed to enter this jacket is controlled, being hottest at low engine speeds, and is reduced as the engine speeds above 600 r.p.m. The greatest heat is maintained at low revolutions to facilitate throttling for fishing and trolling. The weight of the heavy duty engines averages 36 pounds per horsepower at the average cruising propeller speed of 500 to 600 revolutions.

In replacing a previous series of 6½ x 9-inch motors turning at low speeds, it has been found that from one to one and one-half miles gain in speed was the result, and the fuel bills have been reduced 25%. One would scarcely know the engines were running and, as the throttle is opened, the response is as immediate and powerful as a steam engine.

This series of overhead valve engines appeared over two years ago when gasoline declined from 68-70 degrees baume to 56 degrees, where it remains to-day. In developing higher power on the poorer fuel, the Sterling engineers have accomplished a notable advancement. The high speed models are the type employed in the Fisher Trophy Races and have a mark of 38.3 m.p.h. for 50 miles with a single motor installation and the record of 41.8 miles an hour in the mile trials. Twin motors hold the lap record of 40 m.p.h.; 38.8 miles an hour for 50 miles and the mile trials at 47.8, which are the fastest speeds ever made in the races.



Reverse gear end with bilge and air whistle pumps attached



Timing gear end of the half-Vee Sterling tractor engine

Commodore Garfield A. Wood, of Detroit, Mich. The World's Greatest Motor Boatman

Garfield A. Wood, Commodore of the Detroit Yacht Club and Vice-Commodore of the Motor Boat Club of America

"Gar" Wood—the Man

The Story of the Life of the Most Remarkable and Successful Racing Man and Motor Boating Enthusiast the World Has Ever Known

"GAR WOOD'S luck," exclaim his friends when he brings down the largest buck in the northern woods, bags the most ducks in season, adds another trophy to his rapidly growing list or achieves another manufacturing triumph.

This is not a story about Gar Wood's luck but more of a close-up of one of the most talked of men of America and the fact that he has focused the attention of the world in motor boating makes Gar Wood of special interest to our readers.

When asked by a newspaper man if he believed in luck, Gar Wood replied, "In men's experiences there may be a chain of circumstances which seem to cause the fickle Goddess of Fortune to smile upon them, but as for luck, I believe in most instances it follows preparedness and the fellow who leaves anything to luck is taking a long chance." Wood's opinion of luck thus expressed may account for his taking two boats to England to lift the Harmsworth trophy when the speed demonstrated that either boat was capable of lifting the trophy which meant if one boat broke down he still had the chance of winning and the following will demonstrate that Gar Wood has not depended on luck.

America has known many motor boat racing owners. From the day C. C. Riotte, owner of Standard, first won the Gold Cup in 1904 at a speed of 23.6 miles per hour, down through the seventeen years many have contributed their share in the interests of the science which has resulted in an increase in speed up to nearly 80 miles per hour, and in the development of hulls both of the speed and cruising types which has been to the benefit of all boatmen. We have had our Schroeders, Miles, Mankowskies, Blacktons, Judsons, Taylors, Craigs, Gheens, Fishers, Greenings, Jays, Cartledges, Jacksons and many others all of whose names will go down into history. But above them all there is one who stands out head and shoulders. We will never have but one Gar Wood. He is not the kind that stands by and sees the others do the work and win races for him while he foots the bills. He actually builds his own boats and engines. He drives his craft in the races—in short, the secret of his success is his own mechanical genius. And what is more—he is a real sportsman.

—EDITOR.

Garfield A. Wood was born at Mapleton, Iowa, on Dec. 4, 1880, and his family removed to Duluth, Minnesota, when he was quite a small boy.

Quite an important event took place when Garfield reached the mature age of thirteen. He was placed in charge of a motor boat belonging to the United States Government and used in the supervision of construction in Duluth Harbor. These were the first motor boats appearing at the head of the Great Lakes and they were accompanied by the accruing difficulties that were found in the first marine motors and his success in handling them and learning all of the idiosyncrasies of old two-cycle type soon made him an expert on motors.

Garfield's general knowledge of mechanics naturally interested him in the automobile and he became one of the first men in his section of the country to sell Ford cars and the first shipment of five cars of Model MN type was received by him at Duluth and after he moved to St. Paul he continued selling Ford cars at the time the Ford Six was being manufactured.

In 1911 he cruised to Dubuque to attend the Regatta of the Mississippi Valley Power Boat Association on July 4th. This was his first interest in motor boat racing. W. P. Cleveland owned Leading Lady which was a 14-foot boat carrying a six-cylinder, two-cycle engine which the owner had a great deal of difficulty to keep running. Garfield suggested that all the boat needed was proper handling whereupon she was placed in his hands. With a few changes and improvements she won the race, making 30 miles an hour, setting a new record for the event.

It was about this time that Gar Wood's inventive genius was given an opportunity of a much broader scope than on improving motor boats and other smaller devices. While walking along the streets in St. Paul he saw three men endeavoring to raise a dump truck with a small hand winch. After watching their laborious efforts for some time he suggested to the driver that some device should be worked out whereby the engine would dump the load and that Garfield A. Wood was the fellow who could do it. Later on the owner of the truck told him that if he could perfect such a device he would buy it from him.

In connection with his Ford Sales Agency he conducted a machine shop known as the G. A. Wood Company, and after a week's work Gar Wood produced the first Wood Hydraulic Hoist. While it was crude in construction it worked none the less efficiently and it was forthwith sold to the owner of the truck.

Pondering on the possibilities of the wider utility of the motor truck by equipping them with this new device he went to a lawyer but received scant encouragement. Fortunately, the lawyer's assistant overheard the conversation and, speaking to Wood about it later, made out the papers for which the United States patent was granted. Wood realized that in order to develop the possibilities of his new device he should get as close to the center of automobile activity in the United States as possible, hence he moved to Detroit where he opened up a small machine shop.

It will be interesting to know that the simplicity of the new Hydraulic Hoist and its general adaptability to any type of truck caused it to jump into immediate favor with the truck manufacturers. Wood used a column of oil forced into a cylinder by a pump operating from the transmission, to lift the body.

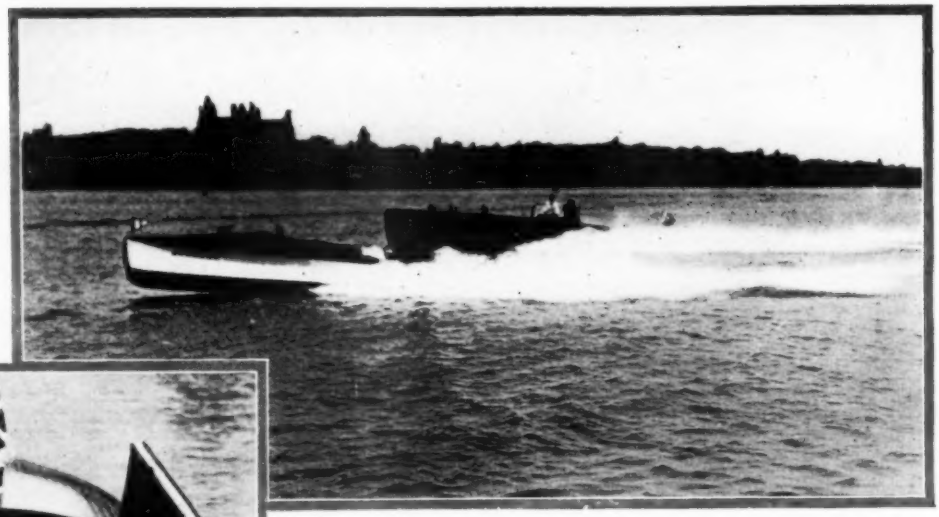
While of course, as Wood explained, water could be used, he found that oil was a self lubricant and that the drivers would not take the trouble to oil the trucks, you could hardly expect them to waste any time oiling the hoist, therefore he knew the hoist was always well oiled.

During the war, the allies used 3,000 Wood Hoists on one American made truck, principally to make and repair roads in the war zone. With this Wood Hydraulic Hoist in operation the trucks could discharge their loads rapidly and get out of the way quickly for it required but thirteen seconds for the truck to deposit its load.

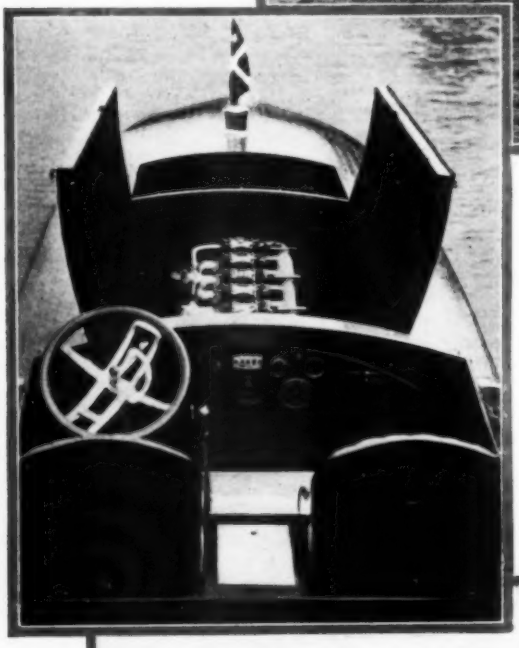
The Hydraulic Hoist, so to speak, with its phenomenal success literally lifted Wood into a financial position which enabled him to give wider attention to the boating sport and pursue his hobby without restrictions.

In 1914 with Little Leading Lady he went to Peoria and won every event in which he could enter the boat. In 1916 he cruised to Georgian Bay and on his return entered the express cruiser race in Detroit's first Gold Cup regatta. He won the race but withdrew the boat when a protest was made that it did not comply with the express cruiser rating. His sportsmanship in this matter was so much

(*Continued on page* 114)



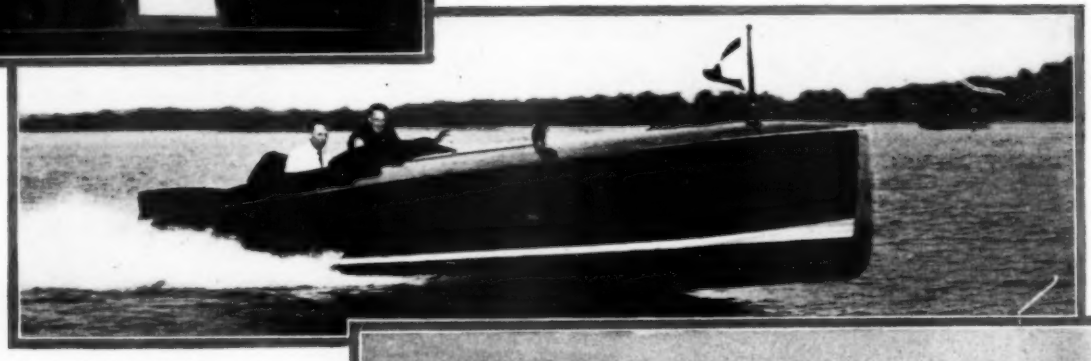
Brush By and Beat It, a pair of Hall-Scott powered runabouts which were frequent competitors in the fast runabout races last season at Buffalo, the Thousand Islands and elsewhere. At races last fall Brush By was driven at the rate of 38.1 m.p.h., which established an American Power-Boat Association record for displacement boats in competition



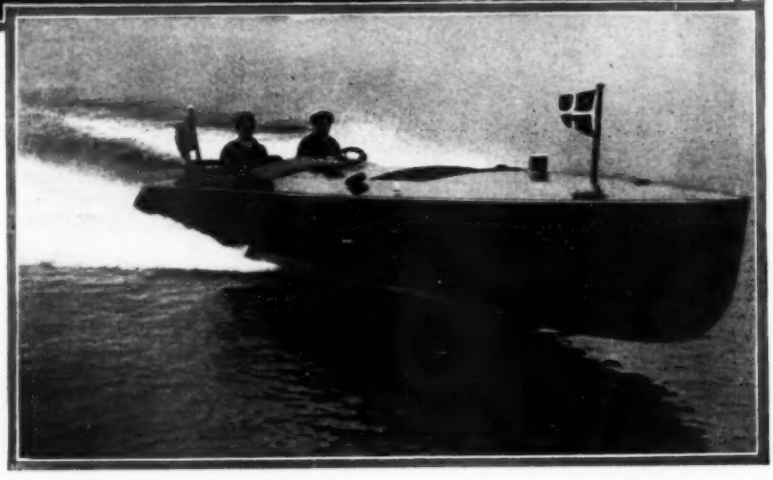
Keen Rivalry Among Runabouts

Many Contenders for the Premier Honors of the Fast Runabout Classes in Competitive Racing

The motor installation of Kalora. The compactness and light weight of the Hall-Scott motors fit them unusually well for service in high-speed boats of this type. All controls are concentrated on the dashboard and the operator knows constantly just what the motor is doing



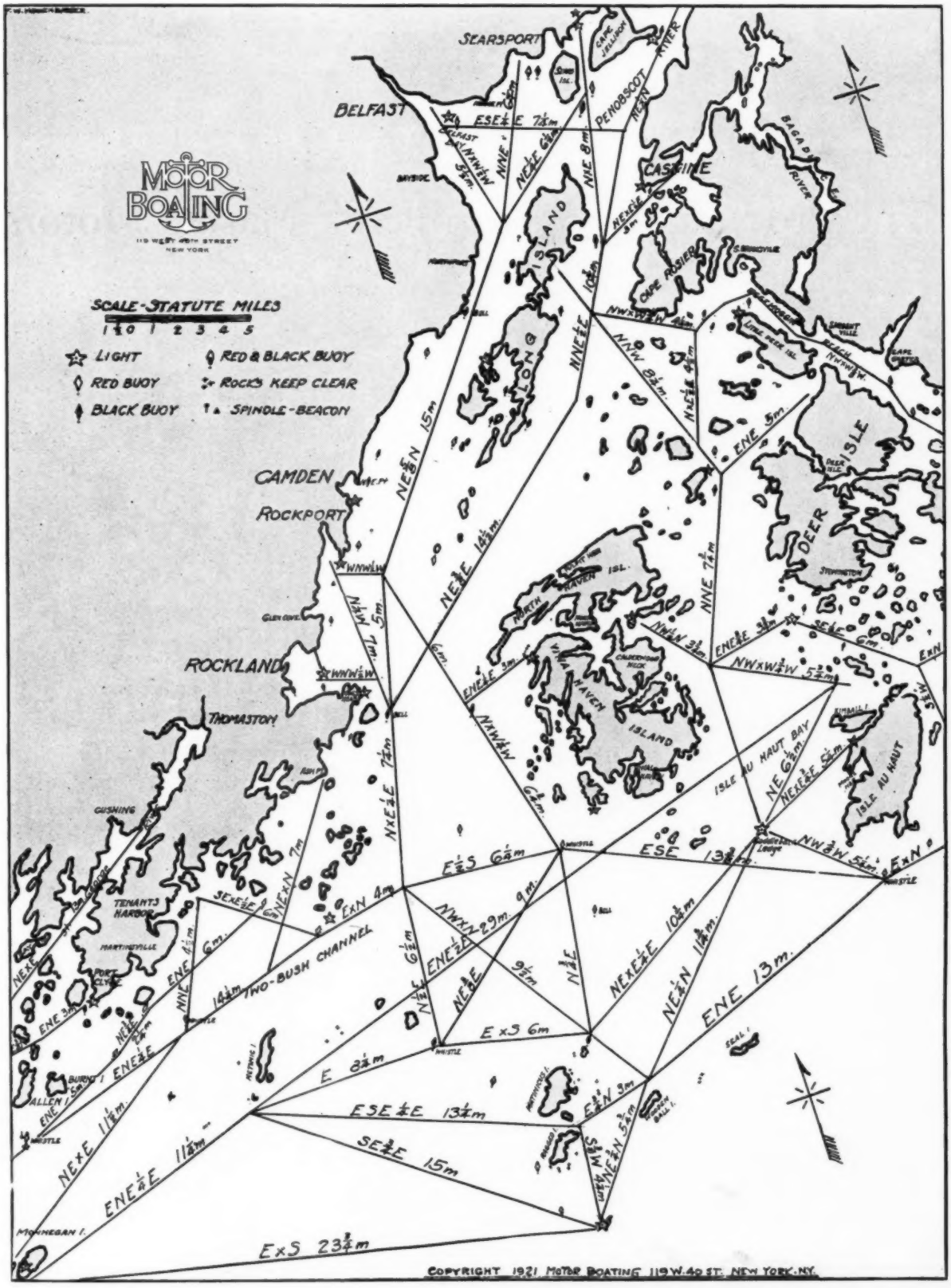
Leopard V, a 30-foot displacement boat owned by Griffith B. Clarke of Toronto. One of the last season's newcomers, she succeeded in her first eighteen days of life in cruising 800 miles and competed in 225 miles of racing at an average of better than 34 m.p.h. without mechanical trouble. Leopard V was built in Canada and is powered with a six-cylinder 200 H.P. Hall-Scott marine motor turning a 20x30 inch Hyde propeller



Kalora will be remembered as the runabout which was shipped overland from the Hacker Boat Company at Detroit to the home waters of her owner, J. W. Packard, Lake Chautauqua, N. Y. Her six-cylinder Hall-Scott motor turns an 18 x 32 inch Hyde propeller at 1,700 r.p.m. resulting in a speed of 38 m.p.h.

Motor Boatmen's Chart No. 21—Coast of Maine, Monhegan to Isle Au Haut

Use in Connection with Coast & Geodetic Survey Charts Nos. 309, 310 311, 319, 320. 321, 1202, 1203



General panorama of the offices and manufacturing departments of the Van Blerck Motor Co. at Monroe, Mich.

The Production of Van Blerck Marine Motors

An Idea of the Vast Amount of Plant and Machinery Required to Produce the Modern High Grade Marine Motor

The hardening of motor parts is essential to their long life. This is where all heat treatment takes place. The tanks contain oil for cooling and tempering parts heated in the oil fired furnaces at the right

Where each motor receives its initial start in life. The new motors are driven by the plant power system for three hours under close observation at increasing speeds. A twelve-hour test under power comes next and the results determine whether the motor is passed or rejected. A trip to the finishing room is followed by a final test before delivery completes the operations

Some of the shop equipment essential to the construction of Van Blerck Motors. The machine shop equipment includes radial drills, multiple drills and drill presses, also a machine for giving the crankshafts a running balance before assembly

The main section of the big machine shop. All machine tool equipment is modern and was purchased especially with a view to its usefulness in producing Van Blerck Motors. Daylight is ample and it will be noted that the shop is clean and orderly. Maximum quality production is possible under these conditions

One of the important parts of the Van Blerck plant. The tool room which manufactures and maintains all tools, jigs and fixtures required. This room is well provided with daylight on three sides and ample artificial lighting is installed for accurate workmanship

Where the parts from the various manufacturing departments are collected and assembled together, the sub and major Assemblies Department. The progressive assembly method is used. Wheel trucks are used to push the motor along as it progresses until completion. It then rolls into the test room. Throughout the entire production of Van Blerck Motors a rigid inspection is maintained at each operation

Correspondence Course Attracts Attention

Questions on Lesson No. 5—A Review of Lesson No. 4 and Some Additional Data on Government Publications, Proper Equipment to Carry, Numbering and Licensing of Motor Boats

See also pages 29-33, 86, 90, 94, 98, 102, 104 *and* 106

THIS month's questions you will find to be considerably different in both form and scope from those of the first four lessons of MoToR BoatinG's Correspondence Course in Piloting, Seamanship and Small Boat Handling. The questions of the four previous lessons followed quite closely the text of the lessons themselves. Now we must begin to depart from the simple "hay foot, straw foot" line of questioning and begin to take up problems and apply the knowledge which we have gained in studying the previous lessons. This does not indicate by any means that one should become frightened or discouraged or fear that the questions or problems will be too difficult or complex for them to readily understand and answer. Quite to the contrary, we will endeavor to keep the problems simple, as we have in the past, and require answers expressed in the least possible number of words. There will be no catch questions or problems involving the use of higher mathematics or any knowledge which is theoretical or not of actual use in the handling of a small motor boat on the coastwise and inland waters of the country. We want you to be able to take a motor craft of any size on these waters and we know that you are anxious to have sufficient knowledge to do so. This will be our sole object in compiling the questions for the remainder of our Correspondence Course lessons.

Just a word in reference to the answers of the previous lessons which we have received. In this issue on page 104 you will find the names of those students, whose papers have been received by us during the month of May, who have passed by at least 80%. This list includes not only those who have passed Lesson No. 4 but those who have passed Lessons 1, 2 and 3 as well provided, of course, their questions were received by us during May.

If you do not find your name among those who have passed and you have reason to believe that your name should be included, do not hesitate to write to the Editor of MoToR BoatinG and ask him if any error has been made. With over 1,000 enrollments and answers coming in each month from all who are enrolled, errors will occur which we might not catch if they were not called to our attention.

The examiners all write us that the answers submitted to them during May were fully as good as previous ones.

Enrollments still continue to reach us and the answers to Lesson No. 1 are still coming in. It is not yet too late to enroll, therefore, if you have not done so and would care to, all you have to do is to send your name to the Editor of MoToR BoatinG and ask him to enroll you. Answers to the questions on the previous lessons may be submitted at any time. They are passed on to the examiners on the last day of each month.

Read This—It's Important

This month's lesson in MoToR BoatinG's Correspondence Course is on the Compass. Lesson No. 7 which will be published in August MoToR BoatinG will also be on the general subject of the Compass but will go more into detail and consider the use of the Compass, determination and application of compass errors, etc. Quite naturally the subjects of Lesson No. 6 and No. 7 are very closely allied. The two lessons should be considered as one and by no means taken separately. In studying Lesson No. 7 in August MoToR BoatinG it will probably be necessary to refer occasionally to the text of Lesson No. 6 in this issue. It, therefore, seems best that instead of having two separate sets of questions on the Compass we should combine these and have one set of questions to cover the whole subject of the Compass which will include both Lessons No. 6 and No. 7. Therefore, there will be no questions on Lesson No. 6 published in August MoToR BoatinG. However, in September MoToR BoatinG the combined set of questions on Lessons 6 and 7 will appear.

The above seems a very logical arrangement in view of the summer season when a large number of those enrolled are making use of their boats and applying the knowledge gained in previous lessons.

However, it should not be taken for granted that the lesson appearing in this issue of MoToR BoatinG should not be studied as faithfully as the first five. It is very essential that every motor boatman should become thoroughly conversant and familiar with the compass. He should learn to box the compass not only by full points but by quarter points both backward and forward. He should visualize the compass card and how each and every point appears on the card without the card actually before him. Instead of writing out answers on the compass during the month of August he should practice the use of the compass on his boat. Compass courses should be sailed whenever possible and a record kept for future reference. The questions which will appear in September MoToR BoatinG on Lessons 6 and 7 will include a large number of practical problems on the compass, application of compass errors, changing from magnetic to true, etc. It is not going to be an easy lesson by a great deal but will be one which can be mastered by everyone enrolled in the course. No one will want to miss a single question. Therefore, we urge that you give the study of the compass serious consideration as it is the most important subject of the whole course and one which is not nearly as difficult or complex as it is usually assumed to be.

Lesson No. 4, to which the questions this month refer, was on Government publications and the proper equipment which is required by the Government to be carried aboard all motor boats. Quite naturally with a subject as broad as one covering Government publications very little, relatively, could appear in the text of Lesson No. 4. The points which we desired most to drive home were that each and every student should obtain for himself copies of the principal Government publications and carefully study the scope of each so that when he had occasion to refer to them he would know how to use them and know exactly what information each publication contained. We did not intend by any means to recommend or even suggest that the contents of the Government publications be learned by heart. These books should be considered more as books of reference for use when data on the subjects which they include is desired or necessary.

Those Government publications which every student should obtain a copy of are mainly the Light List and the Atlantic Coast Tide Tables. It is also desirable to have a copy of the chart catalog and the Buoy List for that particular locality in which the student is most interested. A copy of that particular Coast Pilot for the locality which you are accustomed to cruise should also be obtained. Some doubt seems to exist in the minds of many of those who are enrolled in this course as to just where these publications may be purchased. Therefore, we are printing on page 102 a complete list of the Government agencies handling all the publications. There are additional agencies which handle some of the publications but we have omitted these names from the list.

As we tried to emphasize in Lesson No. 4 the data contained in the Government publications is of inestimable value to every motorboat man. The publications contain data

(*Continued on page* 86)

The Compass as a Common, Convenient and Correct Companion

An Understandable and Simple Explanation of the Motor Boatman's Greatest Friend.—Learning to Box the Compass—Points and Degrees—The Meaning of True and Magnetic Courses — Placing the Compass on Board

MoToR BoatinG's Correspondence Course in Piloting, Seamanship and Small Boat Handling—Lesson No. 6

By Charles F. Chapman

THE subject of this Lesson is the Compass. This is one of the most important subjects in the whole Correspondence Course. This Lesson will be closely allied to Lesson No. 7 in the next issue. Therefore, to have a complete knowledge of the subject it will be necessary to consider the two lessons together.

No one should be afraid or discouraged in his study of the compass. It is true that the manner in which the subject is usually presented is so complex and complicated that it gives one the idea that the compass is a very mysterious and generally misunderstood device. But such is far from the real truth. As a matter of fact, a study of the compass is not necessarily complex but can be made simple and readily understood. As the compass is the mariner's greatest friend it is hoped that everyone will carefully study these pages and follow the course as enthusiastically as they have the previous lessons.

(*Cont'd on p.* 64)

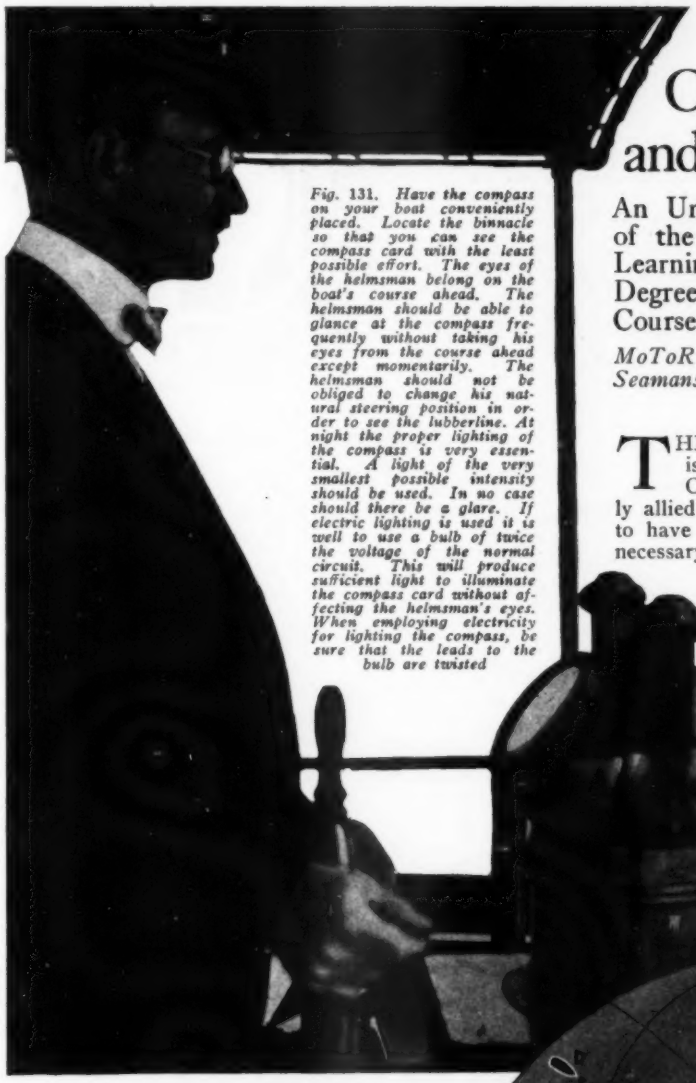


Fig. 131. *Have the compass on your boat conveniently placed. Locate the binnacle so that you can see the compass card with the least possible effort. The eyes of the helmsman belong on the boat's course ahead. The helmsman should be able to glance at the compass frequently without taking his eyes from the course ahead except momentarily. The helmsman should not be obliged to change his natural steering position in order to see the lubberline. At night the proper lighting of the compass is very essential. A light of the very smallest possible intensity should be used. In no case should there be a glare. If electric lighting is used it is well to use a bulb of twice the voltage of the normal circuit. This will produce sufficient light to illuminate the compass card without affecting the helmsman's eyes. When employing electricity for lighting the compass, be sure that the leads to the bulb are twisted*

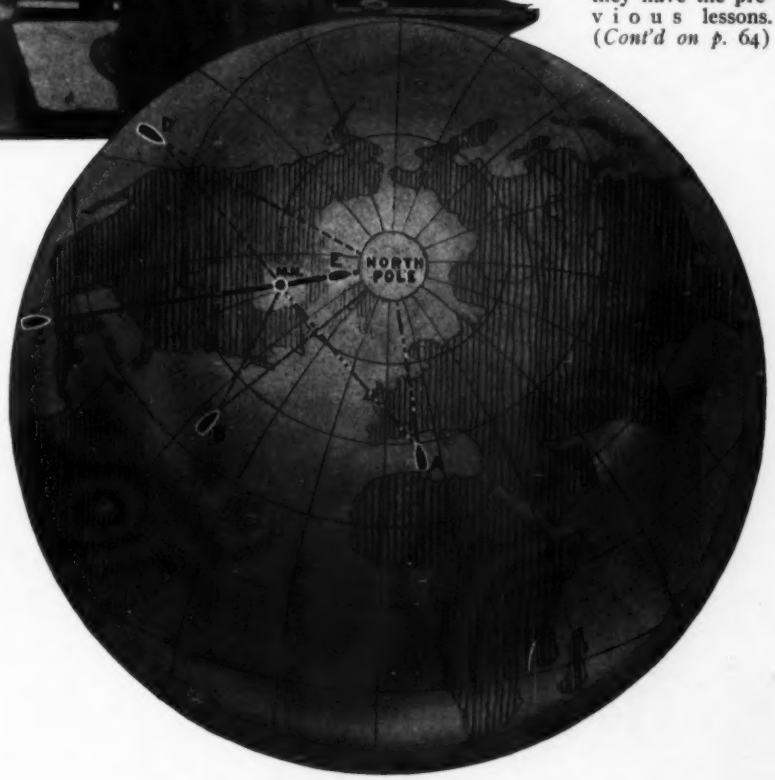


Fig. 132

Fig. 132. *The North Pole of the compass does not point towards the earth's North Geographic Pole as many generally suppose. The compass points towards the North Magnetic Pole which is located at some distance from the North Geographic Pole which is the end of the imaginary axis on which the earth is supposed to rotate. In the illustration at the right the location of the North Magnetic Pole is indicated by MN. Directions which are named in relation to the location of the North Geographic Pole are known as "true" while those named in relation to the Magnetic North Pole are known as "magnetic" directions. The compass, therefore, indicates magnetic directions and not true directions. The meridians and parallels are drawn on the earth's surface in relation to the North Geographic Pole (see Fig.* 132) *and therefore indicate true directions. Due to the fact that the North (Geographic) Pole and the North Magnetic Pole are not coincident magnetic directions and true directions will always differ by a certain amount depending upon the particular location on the surface of the earth where you or the point in question happens to be. For example, if you happen to be at point A, true North will be in the direction which boat A is heading, i. e., towards the North Geographic Pole, while the North point of a compass on that boat would be pointing in the direction of the dotted line towards the point MN. If you are at B, true North would be in the direction toward the North Geographic Pole while magnetic North would be in the direction BMN. If your boat was located at C then she would be heading both true North and magnetic North as obviously magnetic North and true North lie in the same straight line. This angular difference between the direction of true North and magnetic North is known as the variation of the compass*

Fig. 133
Old Compass Card

Fig. 133. (At the left and Fig. 134 at the right). These two figures show what is known as the old compass card and the new compass card. The only difference between the two cards is in the method of naming various directions by degrees. In both cards North is 0 degree. However, on the old card South is also 0 degree while East and West are each 90 degrees. Northeast, Southeast, Southwest, and Northwest in the old card are designated as 45 degrees. In other words we work from 0 degree at North and South towards 90 degrees at East and West. In the new compass cards the designations run from 0 degree to 360 degrees around the card in a clockwise direction. In this card Northeast is 45 degrees, East 90 degrees, Southeast 135 degrees, South 180 degrees, Southwest 225 degrees, West 270 degrees, Northwest 315 degrees, etc. (See also Fig. 148.)

Fig. 134
New Compass Card

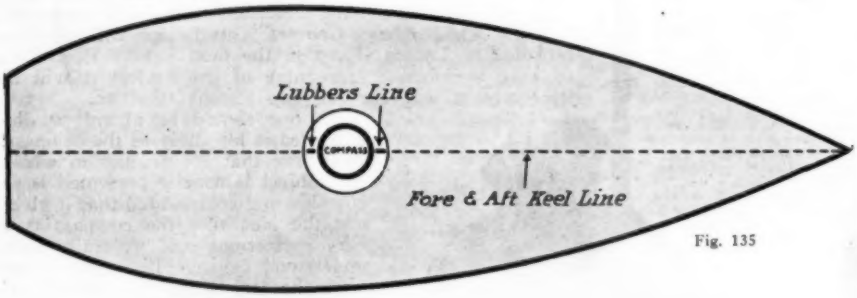


Fig. 135

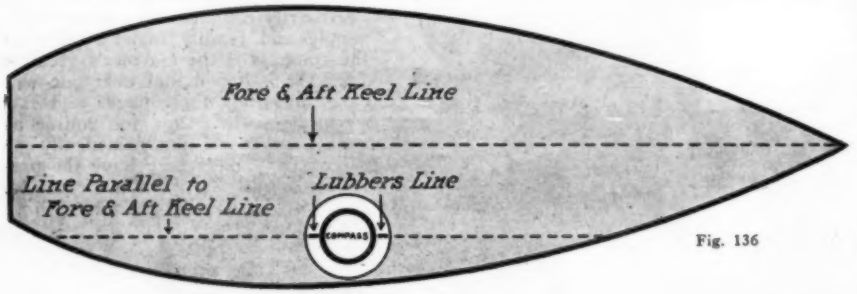


Fig. 136

Figs. 135 and 136. (At the left.) The correct placing of one's compass aboard his boat is very important. If possible place the compass over the keel line. Be sure that an imaginary line drawn through two of the lubberlines and the center of the compass is directly over the keel line and not at an angle with the keel line. If a lubberline does not correctly indicate the boat's bow then the compass will be worse than useless. When the compass can not be placed in the center of a boat over the fore and aft keel line and must be located to one side, then an imaginary line drawn through the lubberlines and the center of the compass must be exactly parallel to the fore and aft keel line as indicated in Fig. 136

Fig. 137. This figure is intended to indicate one of the two ways of naming the quarter points of the compass. The arrows indicate the numerical order of naming the quarter points, viz.: ¼, ½ and ¾, or ¾, ½ and ¼, depending upon the direction of the arrow. In this method of naming the quarter points (which is known as the older method) we work from each cardinal and inter-cardinal point toward the 22½-degree points as indicated by the arrows, thus, N ¼ E, N ½ E, N ¾ E, N x E, N x E ¼ E, N x E ½ E, N x E ¾ E, NNE. Now note how the fractional points change, thus: NE x N ¼ N, NE x N ¼ N, NE x N ¼ N, NE x N, etc.

Fig. 138. This figure indicates the other or newer or Navy method of designating quarter points. As in Fig. 137 the arrows indicate the numerical sequence of the fractional points, thus: N ¼ E, N ½ E, N ¾ E, N x E, N x E ¼ E, N x E ½ E, N x E ¾ E, N NE, N NE ¼ E, N NE ½ E, N NE ¾ E, NE x N. Now a change to this: NE ¾ N, NE ½ N, NE ¼ N NE, NE ¼ E, NE ½ E, NE ¾ E, NE x E, NE x E ¼ E, NE x E ½ E, NE x E ¾ E, E NE, E NE ¼ E, E NE ½ E, E NE ¾ E, E x N, E ¾ N, E ½ N, E ¼ N

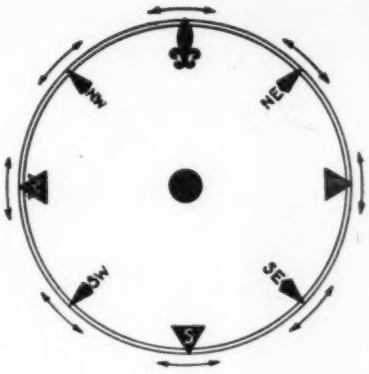


Fig. 139. *(At the left.) The first step in learning the names of the points of the compass is to memorize the names of the four principal points which are known as the cardinal points. The names of the cardinal points, as everyone knows, are North, South, East and West. The inter-cardinal points derive their names from the combination of the names of the cardinal points which are adjacent to them. That gives us the four inter-cardinal points named Northeast, Southeast, Southwest, and Northwest*

Fig. 140. *At the right.) To obtain the names of the next 8 points of the compass we proceed exactly as we did in determining the names of the inter-cardinals. We bisect the space between each cardinal and inter-cardinal and give the new point a name which is a combination of the two. This gives us a point midway between North and Northeast which we call North Northeast; one midway between East and Northeast which we call East Northeast. The one midway between East and Southeast which we call East Southeast, etc.*

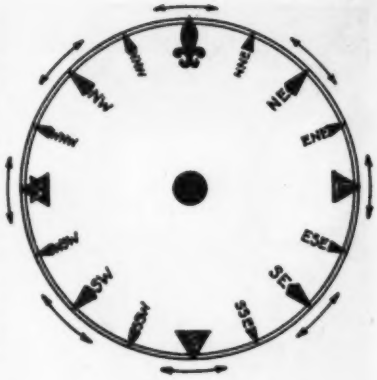
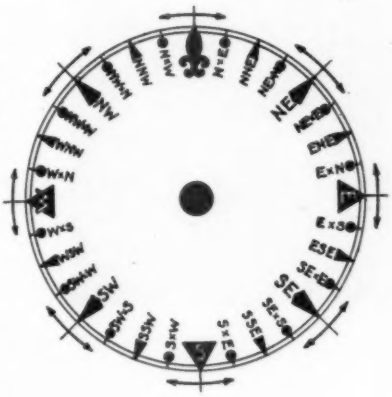


Fig. 141. *(At the right.) To obtain the remaining 16 points of the compass we again bisect the space between the sixteen we have already learned and give the new points a name which is a combination of the cardinal or inter-cardinal point to which they are adjacent and the word "by" according to the direction in which the new point is from its cardinal or inter-cardinal point. For example, the new point adjacent to North toward East will be known as N x E. When it is adjacent to North but to the westward of it it is to be known as N x W. The point adjacent to Northeast and to the North of it will be known as NE x N. The point adjacent to Northeast and to the eastward of it will be known as NE x E, etc.*



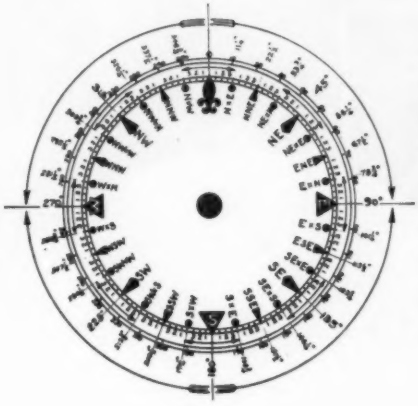


Fig. 142. *(At the left.) In order to steer more directions or more closely than would be possible by the use of the 32 points alone it becomes necessary to subdivide the points into quarter points, half points and three-quarter points. Each of these ¼ points has a particular name depending upon its relative position with the points on each side of it. See Figs.* 137, 138, 143 *and* 148

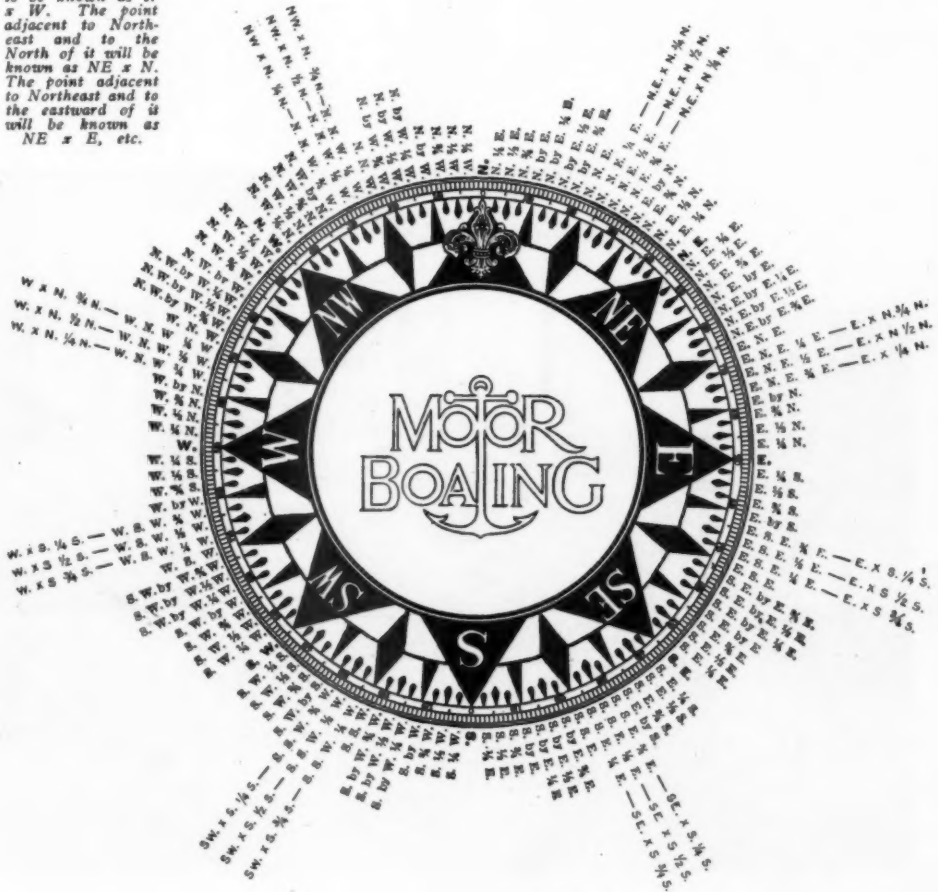


Fig. 143. *(At the left.) The compass card with the names of the 32 points and the 96 quarter points. For those quarter points which have two methods of naming them, the older names are indicated on the outer circle. Those points and quarter points which have only one name beside them in this figure are common to both methods. (See also Figs.* 137, 138 *and* 148.) *The motor boatman should become thoroughly conversant with the names of all the points and quarter points. He should be able to box the compass by quarter points, forward and backward completely around the compass card or through any quadrant.*

Fig. 144. A good form of binnacle and steering wheel when same must be placed on one side of the boat due to the fact that the companion way is in the center. It is decidedly preferable to have the compass and helmsman's position on the starboard side rather than on the port side as such a location will give the helmsman an unobstructed view of the so-called danger zone which extends from dead ahead to two points abaft the starboard beam. It will be remembered that when other boats are in this danger zone approaching your course they will have the right of way over you and it will be necessary for you to give way. It will therefore be seen why it is essential that the helmsman should have a clear and unobstructed view of this danger zone. If the helmsman's position and compass were on the port side it then might be that his view of the danger zone would be obstructed by equipment on deck, high bow, dinghy, passengers, etc.

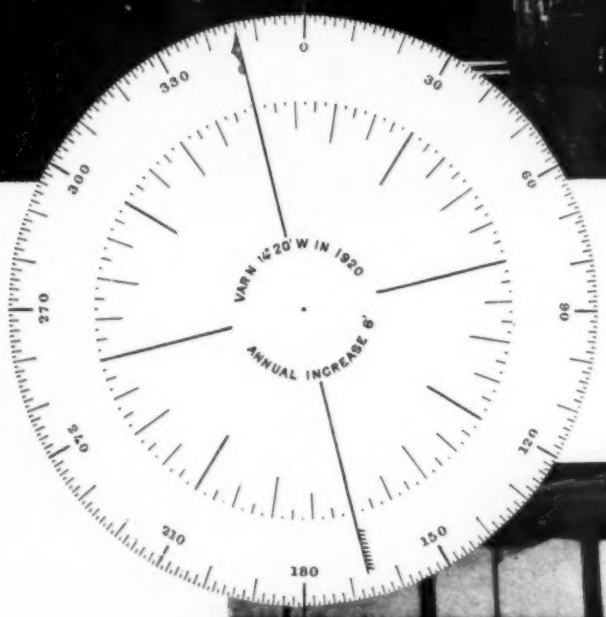


Fig. 145. This is the so-called compass rose which shows magnetic and true directions. On every chart there are several of these compass roses. The one nearest the location in question should always be used. It will be noticed that on the outer periphery of the compass rose the divisions are in degrees running from 0 to 360 in a clockwise direction. These divisions indicate true directions. The inner circle it will be noticed is divided into 32 major parts which are the 32 points of the compass. Each major part is then subdivided into quarters which represent the quarter points of the compass. These divisions (points) of the inner circle are magnetic and should always be used when referring to magnetic directions or magnetic courses. In the center of the compass rose will be noticed that there is a statement showing the amount of the variation for that particular locality where the compass rose is located on the chart. The annual change in variation is also noted

Fig. 146. An excellent arrangement for the compass and binnacle. In this case the compass is located in the center line of the ship directly over the keel line

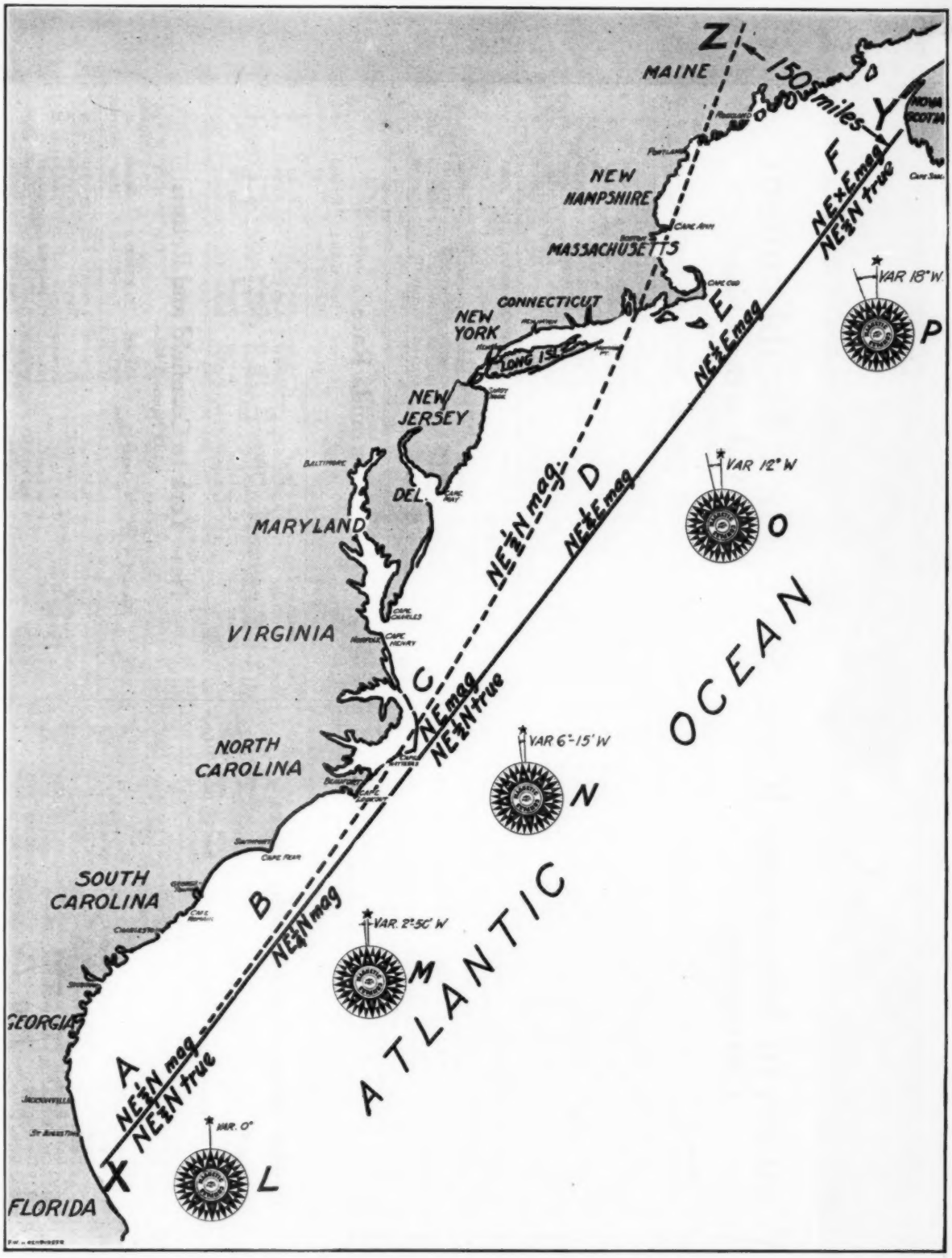


Fig. 147—This figure is intended to indicate the difference between true and magnetic courses and how magnetic directions differ depending upon the particular locality on the earth's surface where the mariner is. For example, one intends to lay a course along the Atlantic Seaboard from Florida to Nova Scotia, say from point X to point Y. If he drew a straight line between these two points as indicated in the figure above and determined the magnetic direction of this line at point A he would find the magnetic course to be NE ½ N. If he steered this magnetic course of NE ½ N expecting that it would take him up the Coast to Nova Scotia along the straight line X Y he would soon come to grief. Not only would he fail to clear Cape Hatteras but this course would take him well inside of Cape Cod and theoretically would land him in the forests of Maine at point Z which is some 150 miles from the point in Nova Scotia which he desired to reach when he set out from Florida. Of course, the reason for this is because a magnetic course of NE ½ N at point A is not in the same direction as a NE ½ N magnetic course is at points B, C, D, E, or F.

On the other hand motor boatmen will see that everywhere along the straight line XY the true courses are identical. In other words, the true course at X is NE ½ N which is the same at B, C, D, E, and F. To steer the proper course along the straight line XY it will be necessary for the motor boatman from time to time to change his compass course, i. e., at B his magnetic course would be NE ¼ N, at C, NE; at D, NE ¼ E; at E, NE ½ E, and at F, NE x E.

The compass roses are indicated at L, M, N, O, and P. These roses indicate magnetic directions and the differences or variation in the direction of North is very evident. The star over each compass rose indicates true North.

For Fig. 148 see page 60, see also pages 64 and 78.

Winners of Important Races Since Their Establishment

Gold Cup Race

Year	Length of Race*	Name of Winning Boat	Owner	Winner's Time Best Heat	Boat Making Fastest Heat	Speed Fastest Heat s.m.p.h.	Number Starters per Heat
1904	96 n.m.	Standard	C. C. Riotte	1:33:30	Standard	23.6	2
1904	96 n.m.	Vingt-et-Un II	W. S. Kilmer	1:27:03	Vingt-et-Un II	25.3	10
1905	90 s.m.	Chip	J. Wainwright	1:52:38	Shooting Star II	24.2	9
1906	90 s.m.	Chip II	J. Wainwright	1:27:01	Dixie	27.8	12
1907	90 s.m.	Chip.II	J. Wainwright	1:26:43	Stranger	27.8	5
1908	90 s.m.	Dixie II	E. J. Schroeder	0:58:13	Dixie II	30.9	8
1909	96 s.m.	Dixie II	E. J. Schroeder	0:58:25	Dixie II	32.9	4
1910	96 s.m.	Dixie III	E. J. Schroeder	0:57:14	Dixie III	33.6	4
1911	84 n.m.	Mit II	J. H. Hayden	0:56:31	Dixie IV	37.3	5
1912	96 s.m.	P. D. Q. II	A. G. Miles	0:52:12	Baby Reliance	37.0	8
1913	87 n.m.	Ankle Deep	C. S. Manowski	0:44:59	Ankle Deep	44.5	6
1914	90 n.m.	Baby Speed Demon II	P. Blackton	0:41:03	Baby Speed Demon II	50.49	9
1915	90 n.m.	Miss Detroit	Miss Detroit P.B.A.	0:42:41	Miss Detroit	48.5	9
1916	90 n.m.	Miss Minneapolis	Miss Minneapolis P.B.A.	0:41:21	Miss Detroit	50.0	6
1917	90 n.m.	Miss Detroit II	G. A. Wood	0:36-47	Miss Detroit II	56.5	3
1918	90 s.m.	Miss Detroit III	G. A. Wood	0:34:36	Whip-po' Will, Jr.	52.9	4
1919	90 s.m.	Miss Detroit III	G. A. Wood	0:32:57	Miss Detroit III	55.0	3
1920	90 s.m.	Miss America	G. A. Wood	0:25:44	Miss America	70.0	6

*Divided into heats of equal length.

British International Trophy Races

Year	Winning Boat	Country	Length of Race	Winner's Time Best Heat	Winner's Speed Best Heat s.m.p.h.	Number of Starters
1903	Napier I	Great Britain				
1904	Trefle a Quatre	France				
1905	Napier II	Great Britain				
1906	Yarrow Napier	Great Britain				
1907	Dixie	United States	1 heat, 35 statute miles	1:15:44	27.8	3
1908	Dixie II	United States	1 heat, 30 nautical miles	1:04:57	31.9	5
1910	Dixie II	United States	1 heat, 30 nautical miles	0:59:44	34.6	4
1911	Dixie IV	United States	2 heats, 30 nautical miles each	0:51:15	40.4	6
1912	Maple Leaf IV	Great Britain	3 heats, 30 nautical miles each.	0:47:48	43.4	5
1913	Maple Leaf IV	Great Britain	3 heats, 32.4 nautical miles ea.	*0:39:28-2-5	*56.5	7
1920	Miss America	United States	2 heats, 38.1 statute miles each	o:37:09-1-5	61.5	5

*Length of course probably in error (short). Speed probably too great.

New York to Block Island

100 Nautical Miles

Year	Winning Boat	Owner	Elapsed Time	Boat Making Fastest Time	Elapsed Time	Number of Starters
1908	Eronel	S. Cochrane	14:45:00	Kittrois	13:36:00	3
1909	Martha	P. Kossek	12:55:20	Margo	12:00:00	4
1910	Elmo II	F. D. Giles, Jr.	12:30:50	Margo	12:14:32	8
1911	Ruth	W. F. Burrough	12:45:20	Thistle	10:50:00	11
1912	Thistle	J. H. Wallace	10:45:00	Thistle	10:45:00	5
1913	Alfred S	H. Soldner	13:04:45	Blue Peter V	10:30:00	10
1914	Alfred S	H. Soldner	13:51:30	Thistle	10:10:00	7
1915	Cero	W. P. Frost	12:07:00	Flyaway III	5:40:20	6
1916	*Countess	W. H. Hand, Jr.	4:12:20	Countess	4:12:20	5
	Oriana	A. E. Luders	11:32:00	Oriana	11:32:00	3
1917	No race on account of war					
1918	No race on account of war					
1919	Gardenia (Class A)	H. Anderson	11:50:00	Gardenia	11:50:00	4
	Victory II (Class B)	H. A. Jackson	12:02:10	Old Glory IV	11:56:10	5
1920	Gardenia (Class A)	H. Anderson	10:45:00	Gardenia	10:45:00	6
	Victory II (Class B)	H. A. Jackson	11:45:28	Victory II	11:45:28	6

*Express Cruiser Class.

Bermuda Race

Year	Winning Boat	Owner	Elapsed Time	Boat Making Fastest Time	Elapsed Time	Number of Starters
1907	Ailsa-Craig	J. Craig	65–39	Ailsa Craig	65–39	2
1908	Ailsa Craig	J. Craig	66–32	Ailsa Craig	66–32	2
1909	Heather	H. Levering	80–56	Heather	80–56	4
1910	Eronel	S. Cochrane	87–29	Eronel	87–29	2
1912	Dream	C. L. Lagen	104–29	Dream	104–29	2
1913	Dream	C. L. Lagen	98–46	Barbara II	85–14	3

New York to Cornfield and Return

183 Nautical Miles

Year	Winning Boat	Owner	Elapsed Time	Boat Making Fastest Time	Elapsed Time	Number of Starters
1912	Alfred S	H. Goldner	27:59:12	Empire	20:40:50	14
1913	Frances H	G. W. Hoertel	21:47:11	Respite	21:47:11	9
1914	Flyaway III	T. B. Taylor	13:00:10	Flyaway III	13:00:10	9
1915	Flyaway III	F. L. Upjohn	10:21:21	Flyaway III	10:21:21	
1916	Edyl	A. Barrett	25:24:10	Edyl	25:24:10	
	*Flyaway III	F. L. Upjohn	7:13:41	Flyaway III	7:13:41	

*Express Cruiser.

New York to Albany and Return

Annual Cruiser Race Record Trophy Championship

New York to Albany and Return

Length of Race—270 Statute Miles

Year	Name of Winning Boat	Owner	Elapsed Time	Boat Making Fastest Time	Elapsed Time	Number of Starters
1909	Martha	P. Kossek	32:45:00	Elmo II	30:50:00	9
	*Bunk III	Meakin & Firth	34:50:00	Bunk III	34:50:00	5
1910	Elmo II	F. D. Giles, Jr.	32:17:35	Elmo II	32:17:35	12
	*Imp	A. Haas	48:25:10	Imp	48:25:10	2
1911	Monreve	E. E. Barney	29:21:18	Excelsior	27:41:17	19
	*Bunk III	Meakin & Firth	34:10:29	Bunk III	34:10:39	4
1912	Respite	V. C. Pedersen	30:41:30	Thistle	27:35:25	15
	*Bunk III	C. Firth	29:22:42	Bunk III	29:22:42	3
1913	Blue Peter V	A. Nachman	23:55:31	Blue Peter V	23:55:31	10
1914	Retta D	C. Dalton	34:58:33	Thistle	23:42:22	8
	*Eastern Star	E. L. Finch	18:44:25	Eastern Star	18:44:25	2
1915	Flyaway III	F. L. Upjohn	12:34:37	Flyaway III	12:34:37	5
	Retta D	C. Dalton	34:23:45	Wilhelmina II	26:25:17	5
	*Amorita	W. T. Randolph	15:04:20	Eastern Star	14:46:50	3
1916	Edyll	A. Barrett	38:10:00	Edyll	38:10:00	2
1917	Heleentje	H. Benjamin	34:28:45	Luetta	29:38:26	8
1918	No race on account of war					
1919	Maybelle V	H. C. Vaughan	36:10:30	Maybelle V	36:10:30	4
1920	No Race					

*Open Boat Class

Marblehead Race

Year	Length of Race Nautical Miles	Name of Winning Boat	Owner	Winner's Elapsed Time	Boat Making Fastest Time	Number of Starters
1905	275	Talisman	W. Saville	45:24:56	Talisman	12
1906	275	Sis	E. Stevens	34:30:56	Unome 33:45:40	12
1907	275	Picaroon	T. W. Bayless	32:57:10	Hopalong 30:40:00	7
1908	270	Irene II	G. P. Granberry	32:33:00	Irene 32:33:00	13
1909	285	Elmo II	F. D. Giles, Jr.	36:32:25	Josephine 32:01:45	12
1910	285	Elmo II	F. D. Giles, Jr.	27:34:45	Blue Peter V 27:34:45	4
1911	240	Classic	J. Craig	33:31:00	Kit Six 27:23:05	4

Annual Cruiser Race Record Trophy Championship on the Delaware

Year	Winning Boat	Owner	Elapsed Time	Course	Starters	Best Time
1911	Chelwood	Capt. Lenning	7:32:54	63 n.m.	18	Same boat.
1912	Chelwood	Rufus J. Lenning	7:05:03	63 n.m.	12	Same boat
1913	Chelwood	Rufus J. Lenning	8:48:00	77 n.m.	12	Casino, Wm. Erb, 7:16:39
1914	Eugenia	Dr. E. Swayne	9:37:18	84 n.m.	12	Liwasa 8:50:38
1915	Eugenia	Dr. E. Swayne	10:16:35	84 n.m.	19	Caprice, E. C. Johnson, 7:55:55
1916	Bedouin	Jules Levey	6:14:03	54 n.m.	13	Helma, W. Fredericks, 5:32:12
1917	Pickaninny	J. V. Bell	5:29:09	46 n.m.	8	Helma, 4:58:45
1918	No race account of war.					
1919	Pickaninny	J. V. Bell	6:26:04	54 n.m.	18	Mascot, C. Hieber, 5:47:22

Annual Championship Events for Record Trophy Speed Boats

Year	Boat	Owner	Elapsed Time	Course	Starters
1911	V. S. C.	W. S. Ware	1:46:34	34 n.m.	8
1912	XQQME	J. C. Vanderslice	1:35:05	34 n.m.	
1913	Alparnel III	R. P. Smith	1:19:25	34 n.m.	
1914	XQQME	J. C. Vanderslice	1:39:13	34 n.m.	4
1915	Dippe Da	E. B. Jackson	1:54:55	34 n.m.	3
1919	Nymph	L. Eisenlohr	1:26:48	34 n.m.	4

Handicap Cruiser Championship of the Delaware River

Year	Winning Boat	Owner	Elapsed Time	Course	Starters	Best Time
1912	Marguerite II	A. B. Cartledge, champ.	19:13:56	190 n.m.	15	Same boat
	Chelwood	R. F. Lenning	Winner of lower rating class, 24:15:35			
1913	Marguerite II	A. B. Cartledge	17:26:42	178 n.m.	12	Same boat
	Claire, III	Dr. J. H. Drexler	20:11:44			
	Haji	H. J. Dudley	20:58:54			
1914	Marguerite II	A. B. Cartledge	17:46:27	188 n.m.	14	Same boat
1915	Marguerite II	A. B. Cartledge	17:32:30	188 n.m.	12	Same boat
1919	Pickaninny	J. V. Bell	11:41:47	103 n.m.	6	Same boat

Cartledge Trophy Series "680" Races on Piston Displacement Only

Date	Boat	Owner	Elapsed Time	Course	Starters
July 12, 1919	Renie H	T. H. Heath	2:20:29	20 n.m.	7
Aug. 30, 1919	Marguerghea	A. B. Cartledge	2:11:35	20 n.m.	5
Oct. 11, 1919	Helma	W. Fredericks	2:07:13	20 n.m.	4
June 6, 1920	Pickaninny	J. V. Bell	2:00:20	20 n.m.	4
Sept. 25, 1920	Pickaninny	J. V. Bell	1:54:05	21 n.m.	4

Penguin—A 25 Foot Auxiliary Sloop

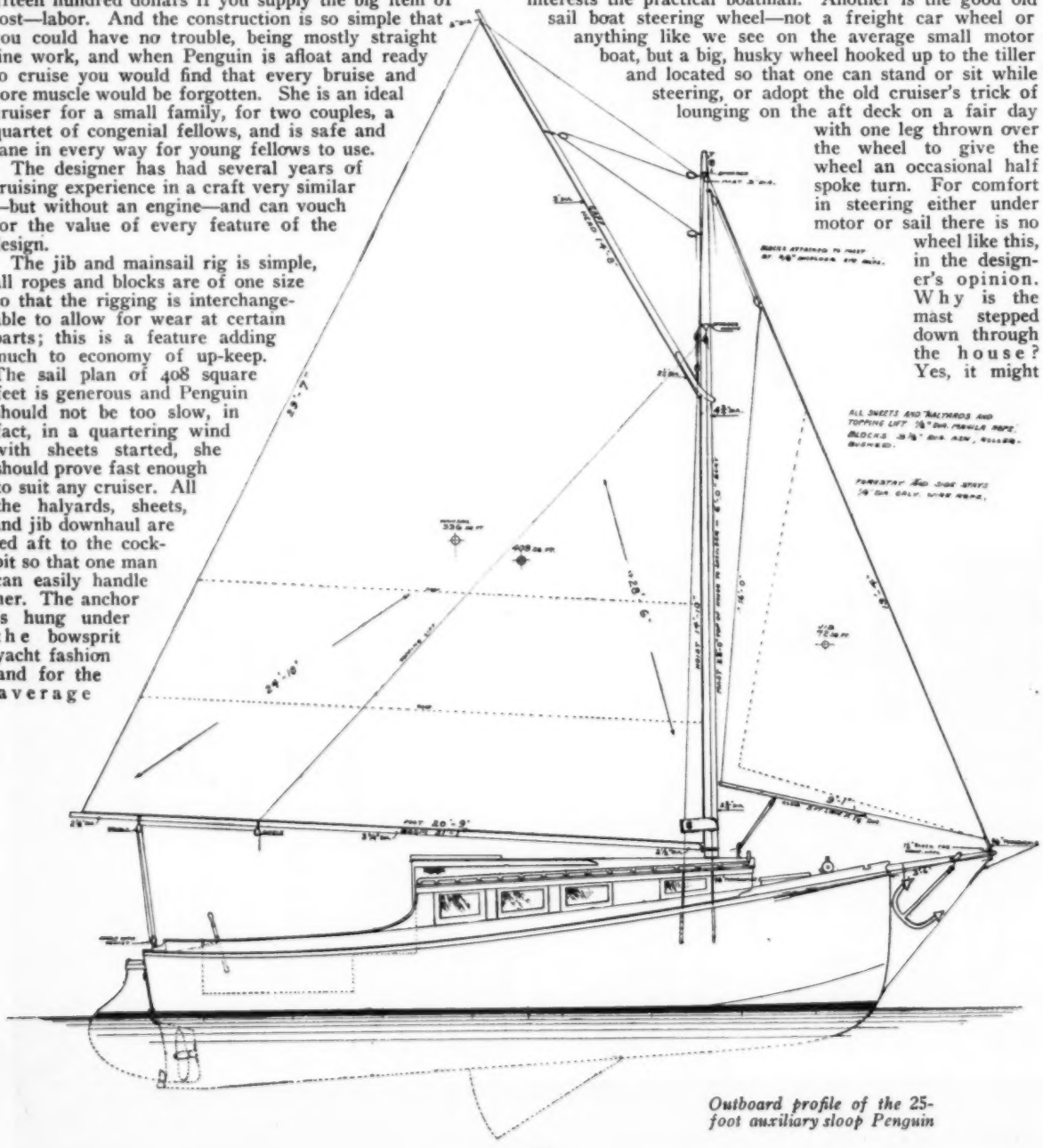
Complete Instructions With All Necessary Information for Building This Popular Type Auxiliary Sloop

Designed by Wm. J. Deed
Exclusively for MoToR BoatinG

PORPOISE, the 20-foot auxiliary cat in the March issue of MoToR BoatinG, proved to be such a popular craft, verifying our impression that small auxiliaries are looked upon by the boating fraternity as offering the ideal craft for to-day, that we are offering our readers this month complete designs of a sloop developed from Porpoise design. See if she doesn't furnish a lot of comfort and fun in a small craft that should not cost you over fifteen hundred dollars if you supply the big item of cost—labor. And the construction is so simple that you could have no trouble, being mostly straight line work, and when Penguin is afloat and ready to cruise you would find that every bruise and sore muscle would be forgotten. She is an ideal cruiser for a small family, for two couples, a quartet of congenial fellows, and is safe and sane in every way for young fellows to use.

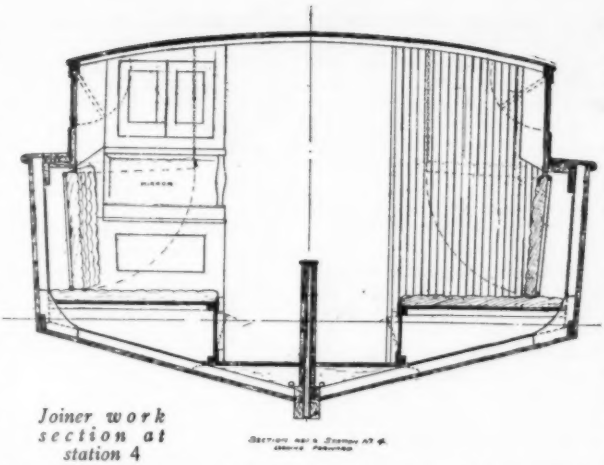
The designer has had several years of cruising experience in a craft very similar—but without an engine—and can vouch for the value of every feature of the design.

The jib and mainsail rig is simple, all ropes and blocks are of one size so that the rigging is interchangeable to allow for wear at certain parts; this is a feature adding much to economy of up-keep. The sail plan of 408 square feet is generous and Penguin should not be too slow, in fact, in a quartering wind with sheets started, she should prove fast enough to suit any cruiser. All the halyards, sheets, and jib downhaul are led aft to the cockpit so that one man can easily handle her. The anchor is hung under the bowsprit yacht fashion and for the average man using this boat either as a motor boat or sail boat this is advantageous, because it relieves him of one of the dirtiest jobs, i.e., that of bringing the anchor aboard and stowing it on the forward deck after cleaning it of sand. Hung under the bowsprit, it can be left till the mud is dry and knocked off, and it is also easily dropped. Much easier than balancing one's self on the forward deck and heaving the anchor over the bows. This is only one item that interests the practical boatman. Another is the good old sail boat steering wheel—not a freight car wheel or anything like we see on the average small motor boat, but a big, husky wheel hooked up to the tiller and located so that one can stand or sit while steering, or adopt the old cruiser's trick of lounging on the aft deck on a fair day with one leg thrown over the wheel to give the wheel an occasional half spoke turn. For comfort in steering either under motor or sail there is no wheel like this, in the designer's opinion. Why is the mast stepped down through the house? Yes, it might



Outboard profile of the 25-foot auxiliary sloop Penguin

have been stepped forward of the house, but it would have been too far forward to balance the sail plan, and if the mast were retained in the position shown, and the house stopped aft of same, the headroom in the galley and toilet room would be killed. The added depth of the mast below the top of the house, bury, it is called, is of value in supporting the mast. The sides of the house have glass windows fitted instead of dead lights or ports as the average cruiser needs more light and more ventilation in the cabin. Too many small cabins are stuffy because the cabin is laid out as if the ship were going out to face big seas and to imitate Al Loomis in his buffeting of big seas; the truth is that, while occasionally a boat is caught out when it is not planned so, and faces exceptional weather, the average use of the boat calls for no more than protection against one foot waves. Wooden shutters can be made to fit over these windows on Penguin if you intend to do any rough work.



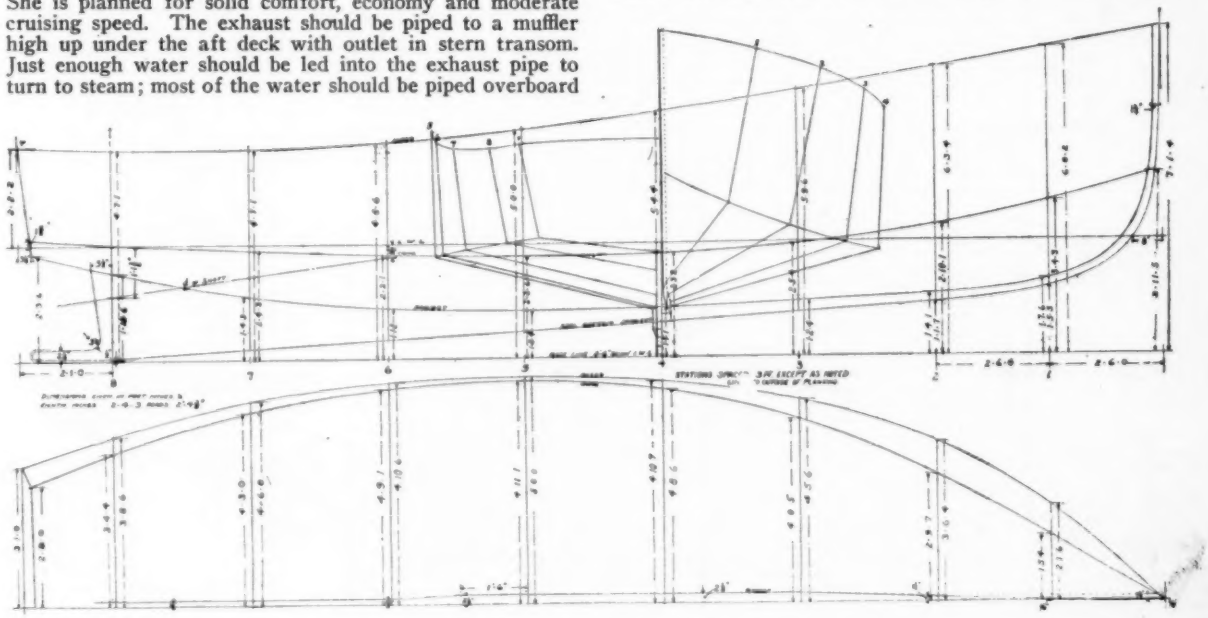
Joiner work section at station 4

Penguin the 25-foot sloop, which Wm. J. Deed has designed for MoToR BoatinG readers this month, promises to outdo in popularity Porpoise, the 20-foot catboat design which was published in March. Many readers have written their appreciation of these designs and it is certain that numerous boats will be built from them. The auxiliary as an all-a-round serviceable craft cannot be beaten. The simple construction and economy of maintenance brings Penguin within the reach of most anyone.—EDITOR.

The plans explain themselves. The cockpit is fairly large and provides two upholstered seats with fuel tanks under as well as a box over the motor that provides a seat, also. The cover of this box lifts off and the sides take down, and there is a flush hatch aft of the box so that good access to the motor is obtained. The motor should be of 5 to 10 h.p., as much power within these limits as the space requirements will permit, and the speed under motor alone will vary from 5 to 8 miles an hour. If you want more power, to get a mile or so more, and a larger motor will fit the space, install it. The motor should be connected up with a one-way clutch or with a reversible propeller. But Penguin is no speed demon and you cannot drive her fast no matter how much power you crowd in. She is planned for solid comfort, economy and moderate cruising speed. The exhaust should be piped to a muffler high up under the aft deck with outlet in stern transom. Just enough water should be led into the exhaust pipe to turn to steam; most of the water should be piped overboard directly at the motor with piping arranged so that the water cannot flow back into the motor. In view of the different heights of exhaust pipes, variations in arrangement, etc., of various motors it is best to take up the details of the whole installation of the motor you install with the manufacturers and install exactly as they specify.

The cabin provides comfortable quarters for four people, the transom berths being 6 feet 6 inches long by 3 feet wide with hinged back cushions 6 feet 5 inches by 25 inches, forming upper berths. The top of these back cushions follows the line of the house in order to gain all the width possible for the berth, so that in order for the back cushion to hinge up properly the forward end of this cushion pipe frame should be attached to pivot at a point level with the top of the aft end of the cushion. There is 5 feet 9½ inches clear headroom in the cabin at the greatest area used, while in the galley the headroom is 5 feet 7½ inches. A curtain separates the cabin and the galley. At the forward end of the transom on the port side is a sideboard with drawers under, with shelf having holes cut to fit pitcher and glasses, and with china closet over. The plans show wood doors to this locker for economy, but if desired these may better be leaded glass doors. On the starboard side is a large full-height clothes closet.

The galley is well planned for actual use. Two ports and two windows provide light and ventilation, there is abundance of stowage room, dish lockers, shelves, etc. In the space under the sink and drain board an ice box can be arranged or, if an ice box is only occasionally needed and extensive refrigerator equipment is not needed, as most boats are used mostly for day trips or week-end trips when very little



Complete set of lines for Penguin, the 25-foot auxiliary sloop

food is carried that requires ice, then the locker forward of the toilet can be zinc lined and fitted with drain to bilge. This locker should be lined with zinc at any rate and made thoroughly tight. On the port side of this forward portion of the cabin is a water closet under the seat, with hinged cover over, and a lavatory on the bulkhead. The bulkhead is tight and forward of same is a forepeak for stowing sails, ropes, etc., and this is entered through a large hatch.

When running along as a motor boat with sails furled an awning may be rigged over the boom and secured to four stanchions set into sockets at the corners of the cockpit just as was suggested for Porpoise. Of course, in such a craft, a permanent awning cannot be arranged—and there's no harm in that, for in many quarters one is more comfortable with no awning.

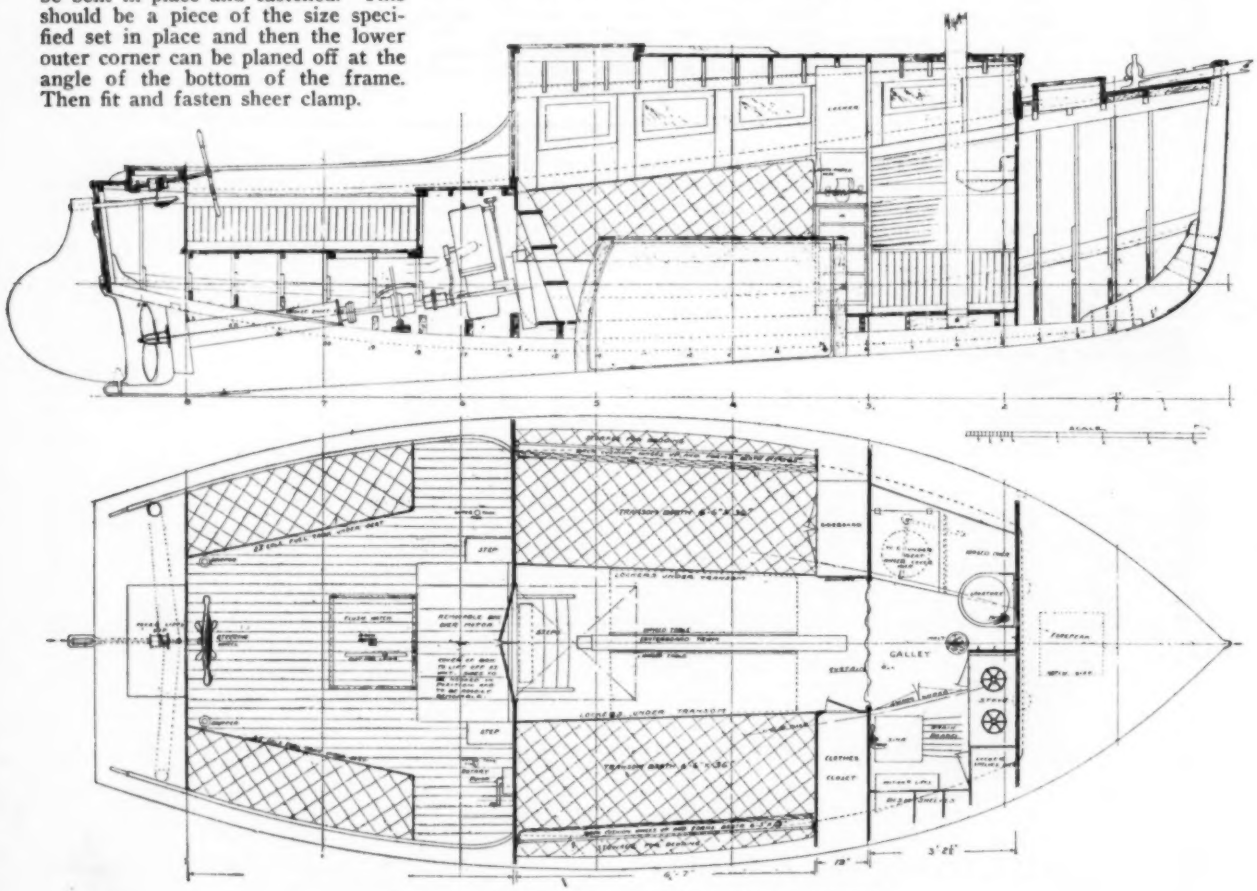
As to building Penguin there shouldn't be many real problems. For the keel you will need a sound white oak piece 23 feet by 17 inches by 5 inches. In the way of the centerboard trunk the keel is 5 inches wide, but forward and aft of this the width is reduced to 3 inches to cut away useless weight and also make for ease of propulsion. The stem, apron, keel, shaft log, transom and centerboard trunk should be gotten out, fastened together, and set up on blocks and stayed as described in the previous articles and in the MoToR BoatinG Handbooks. The frames are located at the stations and also between stations; the former can be gotten out by laying out the shape from the dimensions on the lines drawing and by cutting and fitting these frames together, fastening them and setting them up in place on the keel, then running ribbands around. The intermediate frames can be fitted, marked, cut, and fastened together, then set up and fastened on keel. The floor timbers should be fastened to the frames before they are set up on keel as they can be well fastened to frames when they are laying flat on the floor of the shop. After the frames are secured, stayed, and plumbed the chine log can be bent in place and fastened. This should be a piece of the size specified set in place and then the lower outer corner can be planed off at the angle of the bottom of the frame. Then fit and fasten sheer clamp.

In planking the boat fit the sheer strakes and garboard strakes first, then decide on the best extreme width of planking strake amidships on both bottom and topsides to suit the stock you have on hand and lay these widths off on the frame there. The strakes should not be too wide, about four inches on the bottom and about three and a half inches on the topsides. If you use these widths you will find that you need twelve strakes on the bottom and nine strakes on the topsides, exclusive of the garboard and sheer strakes. At all other frames if you divide the distance between chine corner and garboard strake and distance between chine corner sheer strake into twelve and nine equal parts respectively, you will readily find how wide each strake of planking should be at that point. Then get out the planking accordingly.

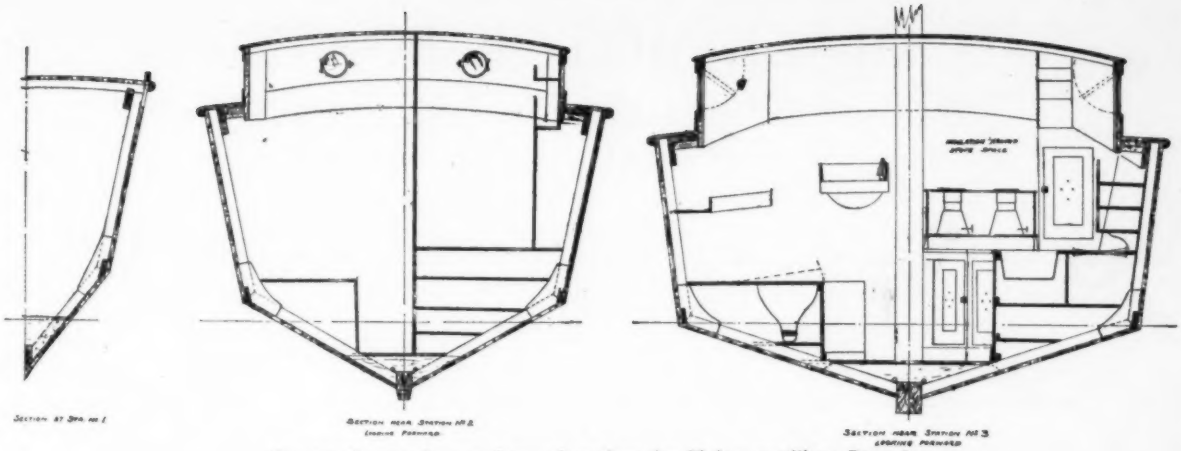
After the hull is well along and the house and cockpit are completed you have the joiner-work to tackle and if you would, about this time, visit the best yacht building yard near you and watch construction details, it would be helpful, though it would be of great assistance if you did this any way for all the construction. You learn more in five minutes than I could tell you in a whole book of description. Particularly is this true also of the rigging. Have the cushions made from a paper pattern of the space the cushion is to fit. Finish the whole boat simply and inexpensively, avoid brass and polished mahogany and you will have a craft that will occupy very little time in up-keep.

Penguin should be the answer for scores asking themselves, "What can I get that I can afford that will yet be a real cruiser and economical for these days when the dollar has to cover the most it ever did?" Penguin is all boat.

Arrangements have been made whereby those desiring full scale blue prints of the drawings for Chum, Shrimp, Nomad, Dolphin, Porpoise, Nautilus and Penguin can secure them by addressing F. W. Horenburger, 63 West 84th Street, New York, N. Y.



Arrangement plan and construction profile for Penguin



Construction sections at forward stations for 25-foot auxiliary Penguin

Specifications

In General: Only the best material and workmanship shall be employed. All lumber shall be air-dried, free and clear of all damaging loose knots, checks, dry rot, sap, etc., that would render it unfit. All fastenings not otherwise specified to be hot dipped galvanized iron. Boat to be built under cover and to be fully insured until completion.

Dimensions of the completed boat to be: Length over all, 25 feet, 1 inch; breadth over planking, 10 feet, 0 inches; draft extreme, 2 feet, 6 inches.

Keel: White oak or yellow pine sided five inches in way of centerboard trunk and three inches at ends. Keel to be in one length, rabbeted for planking, with slot 1¼ inches wide cut for centerboard.

Centerboard Trunk: At each end of slot in keel oak posts 1¼ inches by 3¼ inches to be accurately fitted and riveted in place. Trunk casing to be one inch white pine or cedar boards fastened to posts by brass screws, heads countersunk and plugged. Lower board to be fastened to keel by 5/16 inch birch dowels tightly driven, seam laid with light thread of yacht cotton and white lead. All seams to be caulked, payed with paint, and filled with white lead putty. Cap to be one-inch oak.

Centerboard: To be one-inch oak with opening cut in lower aft corner 12 inches by 12 inches which is to be filled flush with lead for weighting the board down. Board to be hung on one-inch diameter bronze bolt. Board to be raised and lowered by ½-inch diameter Manila rope spliced to eye bolt in centerboard, rope passing through cap and made fast to 4½-inch galvanized cleat on cap.

Stem: To be white oak sided three inches, molded as per plan, beveled to face ¾ inches and fastened to apron by ⅜-inch diameter galvanized rivets as indicated. Bound with brass half-round.

Apron: To be white oak sided three inches, fastened to keel as indicated by ⅜-inch diameter galvanized rivets.

Stern Post: To be white oak 5 x 5 inches reduced in siding to three inches at lower end, to be well secured to keel and to have tenon at top fitting into horn timber.

Shaft Log: White oak sided five inches, molded 7 inches, extending to top of keel and secured to keel by ⅜-inch diameter galvanized rivets. To be bored for shaft to suit diameter of shaft used. Bronze combination shaft log and stuffing box to be secured on inboard end.

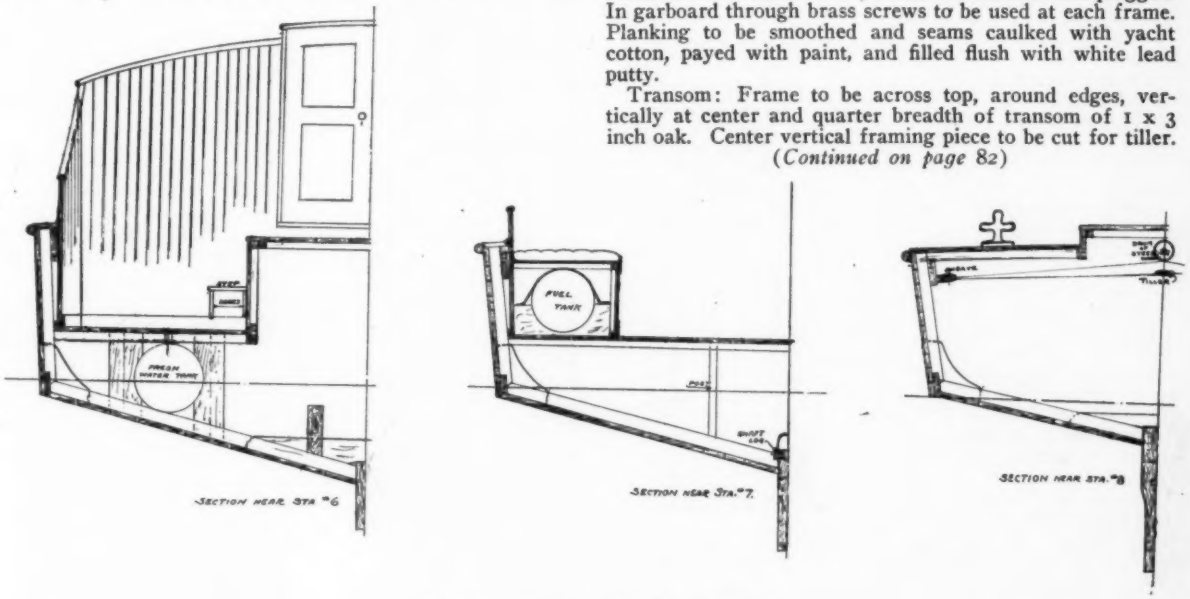
Frames: To be of white oak sided 1⅛ inches, molded 2 inches spaced one at each station with intermediate frames as shown. To be fastened to keel and reinforced at chine by one-inch oak piece.

Floor Timbers: To be oak sided one inch, molded as per plan. Flooring in cabin laid on floor timbers. To be fastened to keel by ⅜-inch diameter galvanized rod. Frames and floor timbers fastened together by galvanized nails riveted over rings. Limbers one-inch drain, to be cut in all floor timbers. Bottom of boat below limbers to be filled with tar pitch or bituminous cement.

Planking: To be white cedar to finish ⅞ inches thick, fastened with brass screws, heads countersunk and plugged. In garboard through brass screws to be used at each frame. Planking to be smoothed and seams caulked with yacht cotton, payed with paint, and filled flush with white lead putty.

Transom: Frame to be across top, around edges, vertically at center and quarter breadth of transom of 1 x 3 inch oak. Center vertical framing piece to be cut for tiller.

(*Continued on page 82*)



After construction sections for Penguin

SMALL MOTOR BOATS

Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions Submitted for the September Prize Contest

1. Describe and illustrate construction and method of attaching emergency rudder to replace one lost while under way.

(Suggested by H. G. L., Baltimore, Md.)

2. Describe an arrangement for installing the reverse lever in a watertight self-bailing cockpit, the clutch being either in cabin or under cockpit floor.

(Suggested by H. H. P., Oakland, Cal.)

3. Describe and illustrate a suitable method for removing the engine from the boat, without the use of an expensive chain hoist.

(Suggested by G. P. M., Highland Park, Illinois)

Rules for the Prize Contest

ANSWERS to the above questions for the September issue, addressed to the Editor of MoToR BoatinG, 119 West 40th St., New York, must be (a) in our hands on or before July 25, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses.

The name will be withheld and initials used.

QUESTIONS for the next contest must reach us on or before July 25. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions below, any article or articles sold by an advertiser advertising in the current issue of MoToR BoatinG of which the advertised price does not exceed $25, or a credit of $25 on any article which sells for more than that amount. There are three prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer all.

For answers which we print that do not win a prize we pay space rates.

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of MoToR BoatinG of which the advertised price does not exceed $5, or a credit of $5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us. The winners should be particular to specify from which advertisers they desire to have their prizes ordered.

The Well Kept Deck

Methods to Follow Which Will Protect the Deck from the Weather and Prevent Shrinking and Opening of the Seams

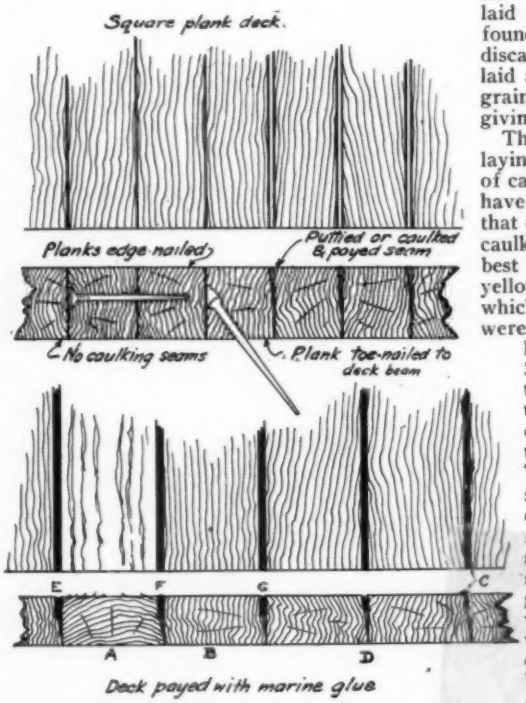
Answers to the Following Question Published in the May Issue

"What method would you pursue to protect your deck from weather, and prevent swelling with the opening of the seams incident thereto?"

Shipshape Decks

(The Prize-Winning Answer)

NOTHING can prevent the shrinking and swelling of wood, especially the wooden deck of a small boat constantly exposed to heat and cold, wet and dry, and both fresh and salt water; the best that can be done is to minimize the effect. In the first place, some woods shrink and swell to a greater extent than others, so wood should be selected for the deck, that, other things being equal, has a low percentage of contraction and expansion. Mahogany, for example, is a wood of this kind, though high in price. Then, narrow widths will expand and contract proportionately less than wide ones, hence, besides presenting a more shipshape appearance, a narrow deck will keep tight much better than one built up of wide planks and is well worth the extra work involved in laying it. Furthermore, the way the grain runs in the deck planks has a direct bearing upon the subject, though a point often neglected by the amateur boat builder. If laid as shown at A in the sketch, or in the reverse position, the grain lying along the top of the plank will soon separate and raise splinters; this is hastened by the action of the weather and such a plank will soon wear away, not to mention the disastrous effects upon bare feet. Planks should always be laid as shown at B and any planks found dressed off as at A should be discarded. But if square pieces are laid as shown above, a good laying grain may usually be obtained by giving the plank a quarter turn.



Fastenings and caulking methods for a weatherproof deck suggested by H. H. P.

The sketches show two ways of laying decks, with several methods of caring for the seams, all of which have been used with fair success; that of laying square planks with no caulking seams whatever worked out best of all. This deck was made of yellow pine plank one inch square which followed the deck curve and were herringboned along the center line, no king plank being used. Such a deck is of course harder to lay and to keep tight, except that there were no long tapered ends, than a straight deck, but this one never leaked a drop. The planks were painted on both sides and were thoroughly dried out when laid; they were toe-nailed to the deck beams as shown, so that no nail heads showed, and edge-nailed together at places. If the builder wished to caulk such a deck, or wished to have the seams show, one side of each plank could be bevelled to form a caulking seam, the seams being paved with white lead putty, colored black if desired, after caulking.

Marine glue is another material used to make tight decks, but unless care is used to have the seams absolutely dry and the makers' instructions are followed explicitly, the glue is apt to crack and bubble out over the seams in time, as seen at C, spoiling the appearance of the deck as well as leaving holes where water can work in. The usual method in laying such a deck is to leave caulking seams, the caulking cotton filling about three-quarters of the seam while the remainder is poured full of glue, as at D. A better way is to have a rectangular groove machined in one edge of each plank as at E with a caulking seam below it; this allows more space for the glue and it is more apt to stay in place. Marine glue is elastic and if properly laid will compress and rise slightly when the planks expand, as seen at F and will sink into the seam as at G when they shrink.

In regard to protecting the deck, high grade marine deck paint is as good as anything if applied when the deck and seams are dry. Boiled linseed oil, applied hot to a deck planed and sandpapered bright, forms a hard protective coating and gives somewhat the appearance of a varnished deck which has seen service and is certainly far more serviceable than a regular varnished deck on a small boat, which can hardly ever be kept in good shape.

H. H. P., Oakland, Calif.

Protecting Decks from Weather

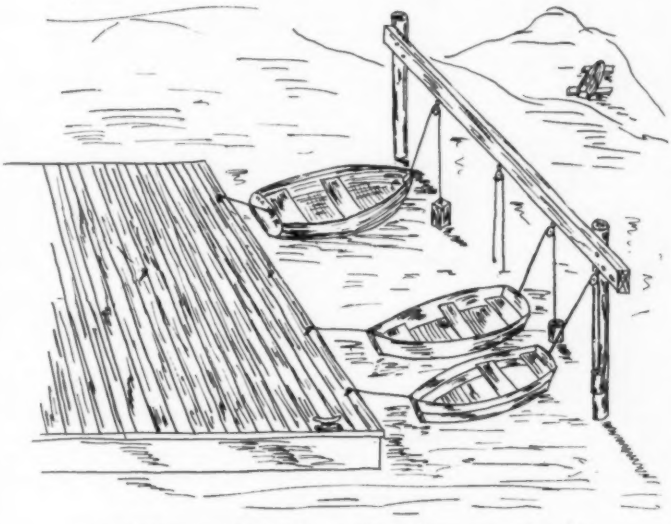
TO prevent woods from shrinking and swelling they must be well dried and thereafter protected from moisture. Wood as it is ordinarily finished is only partially protected and very often is only partially dry when finished. Kiln drying will expell practically all the moisture, but on a damp day kiln-dried lumber will absorb considerable moisture no matter how well protected, and in a short time will contain as much moisture as well-seasoned, air-dried stock. Commercially dry lumber is that which contains not over 15% moisture. This is practically the moisture content of lumber piled under sheds or in buildings not heated and is commonly called air-dried stock.

It is not the amount of moisture in the wood which causes shrinking and swelling but the amount of moisture which it absorbs or gives up. As wood absorbs moisture the fibres swell and the board becomes wider. As this moisture is driven off by heat and ventilation, the fibres assume their natural dry form and the wood shrinks according to the amount of moisture expelled. Shrinkage with the grain is very slight but across the grain it is of marked proportions.

So long as the wood contains a constant amount of moisture there is no shrinkage or swelling, but it is practically impossible to finish, in the ordinary way, wood alternately exposed to rain or moisture and the hot sun, as decks are exposed, in such a manner as to prevent the absorption or evaporation of moisture.

Saturating the wood, filling the pores, with a drying oil is the only recognized treatment. The oils generally used in wood-treating processes discolor the wood to a greater or less extent, and are not adapted to treating decks to be finished in natural wood, and it requires some time and special treatment with shellac or varnish before they can be painted. When applied in wood-treating plants the wood is dried in a vacuum for several hours, and then the preservative is admitted without releasing the vacuum and the wood is thus completely saturated with the preservative at the end of the treatment. Since the commonly used preservatives are not adapted to our purpose and the methods beyond our reach we are forced to resort to the lesser method of brush coating.

Of the oils available for the purpose under consideration, linseed oil seems to be the most practical. It is preferable that the treatment be commenced before the decking is laid and completed after laying. As soon as possible after the stock is worked, treat the wood with a liberal application of hot raw linseed oil and as soon as this is absorbed by the wood apply a second coat in the same manner. Raw linseed oil is a non-drying oil, therefore it will not dry on the surface but will continue to strike into the wood. Both sides, edges and ends should be given all the oil they will take.



A solution by W. B. M. of the problem of caring for the dinghy fleet at the club house

When laying the deck, be particular to apply the oil (hot) in liberal quantities to all cuts. After the deck is laid, caulked, seamed and scraped, complete the treatment by applying several more coats of linseed oil, using boiled oil, which is self-drying, for the last two coats. Linseed oil will not discolor any wood although it will slightly darken it. When dry the wood can be sanded smooth and finished with any good spar varnish.

(*Continued on page 57*)

The Problem of the Tender

A Solution for the Troublesome Question of Where To Keep the Many Tenders at the Yacht Club House

Answers to the Following Question Published in the May Issue

"Describe and illustrate the best way to keep a number of tenders at a yacht club float"

Keeping Tenders at the Club Float

(The Prize-Winning Answer)

TIEING up several tenders at the club float so that they will not bang against each other and drift around in such a manner, that to get your own tender, it is necessary to untie several painters and push the other small boats out of the way, and then dodge them until you are clear, requires more than a couple of cleats on the float to make fast to. This conjestion of tenders at the float may be avoided by arranging a plank or cable between two piles and attaching pulleys to the cable and cleats or rings to the float to moor to.

Arrange the pulleys and cleats so that there is space

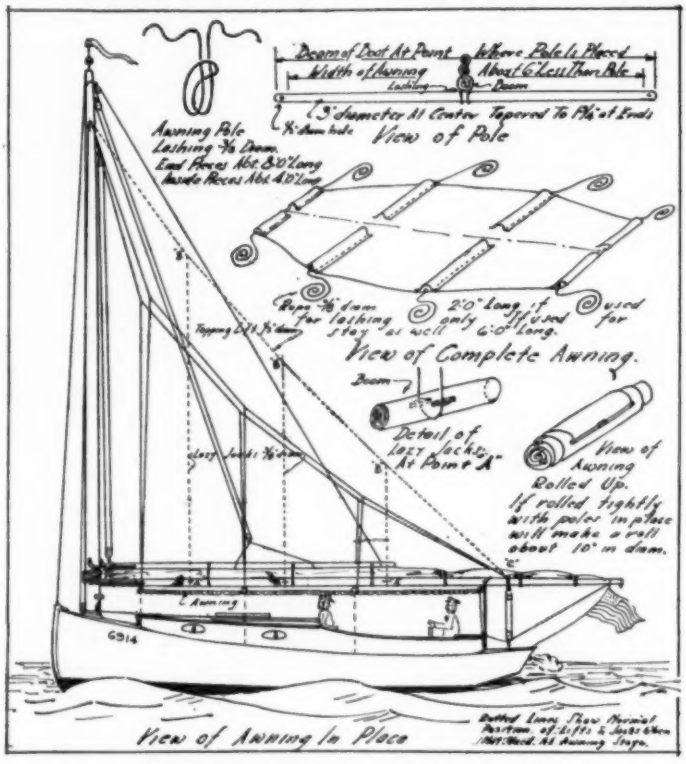
enough between centers to prevent the tenders from chafing and hang a weight over the pulleys by means of a light line having a limit stop so that the end will not run through the pulley when released. As you come up to the float, pick up a line and attach it to the bow or stern, as you wish, and make your painted tie a short line fast to the float. When you leave, let go the line and row out. The weight line will swing over as you crowd it, offering but little resistance, and the stop will prevent the line from running through the pulley.

In waters where ice is not a consideration, it is desirable to drive about 8-inch piles at a sufficient distance from the float to clear any tender at the club and the outer one even with the outer end of the float. This outer pile will serve a two-fold purpose by making it possible for two or more motor boats to lay at the float at the same time and still leave room for another boat to land. This is accomplished by making either the bow or the stern fast to the pile and the other end to the float.

The method of constructing this tender mooring arrangement will depend largely upon individual conditions and will allow wide variations without affecting its efficiency. When there is not enough ice to carry away the piling have a dock builder drive them and use a cable between for fastening the pulleys to. It would be unwise to spend the club's money, fitting up a rig that would have to be renewed every season.

When the bottom is soft you can with a little help drive four- or five-inch stakes without any equipment other than that found on every motor boat. First point the small end of the stake and about 4 feet above the water, nail on a cross-batton sufficiently strong to allow a man to jump on each side at the same time. Place the stake from a row boat, pushing it into the mud, and stay it up with lines or otherwise. Let a man climb on each side of the cross-batton and spring without jumping. When the stake will go no farther let them jump on it together. When possible to strike a heavy mallet, beetle or sledge will be found useful. A timber between the stakes for fastening the pulleys to will be found more satisfactory than the cable, as the pull of the weights on the cable would soon give the stakes an undesirable inward slant. This method has been in use for years in Catskill Creek for mooring the smaller motor boats, and has proven entirely satisfactory. By exercising a little care in laying out and fitting up the rig according to conditions, it will give equal results at most any club, where the piles or stakes can be driven. Should the bottom be rocky, the scheme may be revised by mooring a keg at the outer end and leading a chain or cable ashore. Small buoys capable of suspending the chain in loops so that it may be passed over will here replace the weights and pulleys and answer the same purpose.

W. B. M.,
Newburgh, N. Y.



The auxiliary awning suggested by A. G. W.

Handling the Dinghy

ONE of the most annoying problems of every yacht club is that of satisfactory storage for the numerous small boats. The common way of disposing of these is to tie them all up to a few cleats at corners of the runways or floats. This method has nothing to commend it at all. The boats are moved about by the wind and tide with damage and injury due to the contact. While it is best for the small boat to remain continuously in the water the chances of damage from week to week are high when the boat is left to its own devices.

A very satisfactory storage arrangement for small boats is in successful use at a yacht club near here with which little trouble is experienced. It is a very simple method and can be readily installed. Its essentials are a platform or wharf space of sufficient area on shore combined with an inclined runway leading to a floating landing stage. An essential feature is a line of hardwood roller spaced about three feet apart and supported in suitable bearings. The method of use consists in drawing the small boat bodily from the water and running it up the incline to the storage

(*Continued on page* 57)

An Awning on the Auxiliary

Valuable Suggestions for a Shipshape Rig Which May Be Quickly Set and Stowed

Answers to the Following Question Published in the May Issue

"How would you rig an awning on an auxiliary, so that it may be easily set and stowed?"

An Awning for the Auxiliary

(The Prize-Winning Answer)

TO rig an awning on an auxiliary is a very interesting problem. The accompanying drawing shows a very simple and satisfactory arrangement that has been in use for a long time. The awning is made of eight oz. canvas cut to shape, to within three inches of the side of the boat. Awning pole slips are sewed on as indicated to receive the awning poles. A grommet is put at the outer edge of the awning at the pole slips, into which is spliced a short line for the purpose of fastening to the end of the poles. The outer edge of the awning may be reinforced with bolt rope or reinforcing pieces at the ends of the pole slips.

To set the awning first put the poles in the slips; make fast to the ends of the poles; roll the awning and poles up together; start at the bow and lash the center of the first pole to the boom securely; unroll to the next pole and make fast to the boom and so on until the last pole is set. The lashings at the aft corner of the awning for the last pole should be about six feet long so same may be used to stay the pole to the deck. Now slack off quite a bit on both topping lifts; take the shortest lazy jack and make a clove hitch at each end of the second awning pole from the stern, being careful the center of the jack is at the boom so lifts will be about the same height on both sides. Do the same with the remaining poles; tighten the topping lifts so they hold the awning horizontal. It will take a bit of experimenting the first time to get it just right but after that it will be easy.

If the lazy jacks are not rigged this way it may be simpler to have the awning lashings longer and tie them to the deck as shown by the dash lines.

At times the boom is very low and the gooseneck at the mast does not permit raising the boom enough to give sufficient head room or to allow proper view ahead, then it will be necessary to put the awning on the top of the boom and gaff instead of underneath as shown. In that case the peak halyard is taken off and tied around the mast out of the way.

The awning as shown is without a hole in it and furnishes good protection against rain as well as against sun. It covers the cabin top, keeping the cabin cool as well as providing a nice lounging place on a hot day.

In putting the awning away, if you have the space it may be rolled up as shown, if not, then remove the poles and fold the awning and stow away separately.

The arrangement of the topping lift and lazy jacks shown is a very fine stunt and a bit of explanation may not be out of place. The topping lift is a continuous rope from the cleat on the back of the cabin on the starboard side, to the deck block, up the mast to the check block, then down to the boom at point C where it is spliced to the boom traveler or a clove hitch is taken around the boom, the other end returning back up the mast and to the back of the cabin on the port side. The lazy jacks which are lighter lines are spliced to the topping lift at points B and are arranged to pass under the boom at points A with a wood fairleader on each side as shown.

In light weather the lifts will hardly be touched but in heavy weather when there is a danger of the boom striking the water, take up on the weather lift then the lift on the lee side will hang slack and at the same time it will permit the lazy jacks to slide under the boom without any tension on them. As you come about when the boom is just past midship, slack off on the previous weather lift just enough to permit the boom to rest its weight on both lifts and just as the sail is about to fill again take up on the new weather lift. It is an easy matter to lift the boom when the sail is up as you only have the weight of part of the boom to lift, the sail is supported by the gaff.

In lowering the sail, set the boom to the proper height with one of the lifts; slack off the sheet rope and let the sail rattle free, then lower the gaff slowly and as long as the sheet is free the sail will fold itself very nicely along the boom without any fuss or trouble. It can then be properly secured as necessary.

A. G. W.,
New York, N. Y.

Comfort on the Auxiliary

NOTHING looks so bad or is so uncomfortable to be under as the loose, sagging, flapping awning too often seen on an auxiliary. The one here described is practically as rigid as a pipe frame awning, yet is the limit of simplicity, consisting of only the canvas and seven sticks.

Make up the canvas to the shape of the portion of the cockpit intended to be covered. Sew pockets on the under side as shown. AB and EF may be made by turning under the edge, also AE and BF. The others are of strips sewed on. The side pockets are to be over, and the center one under, the transverse pockets for the battens. At A, G, H, B and E, I, J, F are eyelets with lengths of ¼ or 5/16-inch cotton rope spliced in so as to go around the pole when it is in the pocket. Length of rope to be sufficient to go down to coaming and belay on cleat as shown in assembly sketch. At C, K, L, D are pairs of eyelets with lengths of rope through, to go under the center pole, and of sufficient length to tie around the boom and gaff with sail furled and sail cover on.

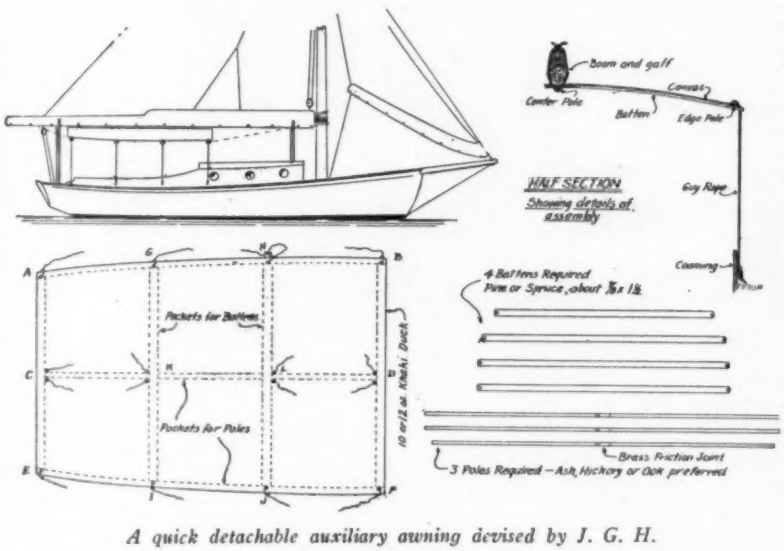
The woodwork consists of four battens of proper length to fit the transverse pockets and extend a couple of inches beyond. Each has a hole, with smoothed and sanded edges, at the extreme end. ⅞ x 1½ inch will do for cockpits 7 feet or so wide, but for very wide boats, like cape cats, thicker battens are needed. Provide also three poles, round, 1 inch diameter, of length to fit the side and center pockets (which pockets should be closed at one end and have flap to button over at the other end). For convenient stowage these poles should have a brass friction joint, of the sort used on double canoe paddles.

To set awning: raise boom to desired height and set crutch to hold it (there should be two sets of foot stops on deck, so that with crutch legs wide, boom will be down, and with them closer together it will be up at awning height). An additional small crutch for forward end of boom is desirable. Slip center pole into its pocket and tie to boom with ropes C, K, L, D. Slip side poles in their pockets, and then the battens. Put the side ropes through the holes in ends of battens, as indicated at H. Belay ropes to cleats, setting up tight enough to give a fair crown to battens. It will be seen that these ropes not only hold the edge down, but also stretch the canvas smoothly athwartship, and the edge poles prevent sag between battens. In rough water or considerable wind ropes may be taken from the end battens forward and aft to the boom, as indicated by dotted lines, but this is seldom necessary.

Reversal of the above operations will remove and stow the awning in less than three minutes, the canvas going in a locker and the wood strips making a compact bundle to slip under a cockpit seat.

Side curtains may be provided to button to this awning if desired. Side curtains can be made of khaki or canvas and should be fitted with grommets to permit fastening to coaming or deck over curtain spring fasteners. Small celluloid windows about 6 x 8 inches can be sewed into the side curtain members for greater convenience. This celluloid is made especially for curtains. But do not put a scalloped fringe on it. That is all right on a hot dog booth at Coney Island, but all wrong on a yacht.

J. G. H.,
Dunedin, Fla.



A quick detachable auxiliary awning devised by J. G. H.

Yard and Shop

Notes of Interest to Both Owner and Manufacturer

Motor Boat Show at Detroit

Many years ago a Motor Boat Show was held in Detroit. During the month of May another show was held which was quite successful. Detroit is one of the active centers of the motor boat and engine industry and turned out in force to support the show.

The largest exhibitor was the Belle Isle Boat & Engine Company which showed one of their standard Bear Cat runabout models equipped with a six-cylinder Sterling motor and a duplicate with 125 h.p. Hall-Scott motor. A complete assortment of the smaller boats made by this company were also exhibited and included the small yacht tenders, sailing dories and canoes.

The Van Blerck Company showed their six- and eight-cylinder marine engines of the high speed and medium duty types, both equipped with the Van Blerck fuelizer to add to their efficiency.

The Central Marine Service Corporation showed two of their new boats. One was a 26-foot stock model equipped with a 100 h.p. Hall-Scott motor for which a speed of 33 m.p.h. was guaranteed. The other was a standardized 21-foot Hacker express runabout equipped with a 20 h.p. Kermath motor. A speed for this was guaranteed to be 20 m.p.h. These boats were handsomely finished and proved one of the features of the show.

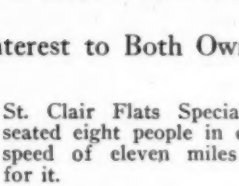
The Caille Perfection Motor Company displayed their complete variety of motors, prominent among these being the 14 h.p. Caille Aristocrat and also a two-cylinder unit of 6 to 8 h.p., both finished with white enamel which is the stock finish. The outboard motor line was complete and included the famous 5-speed motor equipped with a pull starter, as well as the Liberty Drive model. For canoe and small boat use the little Bantam motor was shown.

The boats of the Disappearing Propeller Company were shown in the Belle Isle booth and proved one of the attractions of the show. A Cape Cod Dory was also shown by the same company.

The Michigan Marine Motor Company displayed a single-cylinder, four-cycle motor in motion. A unique illustration of the waterproof ability of the electrical equipment was the continuous discharge of the cooling water over the timer.

Reverse gears of the Standard Gear Company in all sizes and types were one of the conspicuous features. Some of these were sectioned models in order to disclose the interior construction.

The Hess Motor Company exhibited a single-cylinder model installed in an 18-foot boat called the St. Clair Flats Special. This boat seated eight people in comfort and a speed of eleven miles was claimed for it.



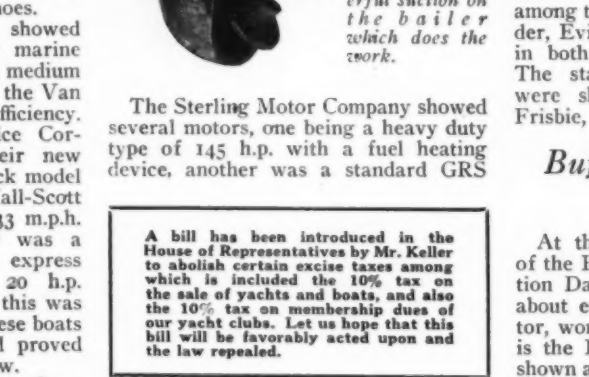
The St. Clair Automatic Bailer was part of the equipment of Gar Jr. II on its record-breaking run up the coast from Miami to Detroit. They are capable of clearing out a bilge in quick time and will remove all traces of water without effort. There is no connection with the motor. The forward action of the boat creates a powerful suction on the bailer which does the work.

The Sterling Motor Company showed several motors, one being a heavy duty type of 145 h.p. with a fuel heating device, another was a standard GRS super speed model, developing 275 h.p. This motor was equipped with double carburetors and Philbrin ignition, while the other motor was supplied with Atwater Kent distributor and a Berling magneto. Numerous other exhibitors showed accessories and other marine articles, among which can be listed Wheeler-Schebler Carburetors, O. K. Giant Storage Batteries, Delco Light Auxiliary Outfits, Hyde Propellers and numerous other accessories.

The Kermath Motor Company displayed a complete assortment of their varied styles of marine motors. These included the new double cylinder, four and six h.p. models and also the 12, 20 and 40 h.p. four-cylinder types. These were equipped throughout with Bosch Magnetos and Kingston carburetors.

All the popular makes of outboard motors were displayed by the Belle Isle Boat Company at their exhibit and among these were the Arrow two-cylinder, Evinrude, Gierholt and Waterman in both inboard and outboard styles. The standard marine motors which were shown included J.V.B., Regal, Frisbie, Roberts and Universal.

A bill has been introduced in the House of Representatives by Mr. Keller to abolish certain excise taxes among which is included the 10% tax on the sale of yachts and boats, and also the 10% tax on membership dues of our yacht clubs. Let us hope that this bill will be favorably acted upon and the law repealed.



The generating set known as the C-Y-C, formerly manufactured by Carlton, Young and Catlin, Inc., has been taken over by the Columbian Bronze Corporation who will put these units into immediate production. This set generates 1½ k.w. for power and light, the motor operating on kerosene or gasoline. Engine parts are interchangeable with Ford parts which will insure ease in repairs

Buffalo Opens Racing Season

At the going-into-commission races of the Buffalo Launch Club on Decoration Day, Wiki Wiki III, a fast runabout equipped with a Hall-Scott motor, won the race for runabouts. This is the Belle Isle Bear Cat which was shown at the show last winter and spent three months in Florida. Among the defeated boats were such well known contenders as Bone Dry, Over the Top, Sari and Lidwina II. In a chance race later Mystyic finished first, Arab IV second and Lidwina II third. Sari, Jinx, Romana, and Gypsy finished in the order named. A third event, a race for hydroplanes, was contested between Mystyic, Arab IV and Miss Peerless. Arab IV won this race with Mystyic second. All these races were ten-mile events, and during the afternoon Captain Dinty Moore took Commodore F. G. Ericson of Toronto up with him as a passenger in Commodore Humphrey Birge's Canuck airplane, and while flying over the water Commodore Ericson thrilled the crowd by climbing out on the wings and doing some hair-raising stunts. Captain McCrudden took his Canuck ship into the air with Mrs. A. G. Utz as passenger and also did some very clever flying. Prizes were presented by Commodore Sidway to all the winners in the various events.

Miss Chicago

The Miss Chicago Syndicate, composed of Sheldon Clark, Mayor Thompson and some others, have

placed an order with the Central Marine Service Corporation for a 22 x 6 Smith hydroplane to be equipped with a 12-cylinder Smith marine twin six of 450 h.p. This boat will have a guaranteed speed of 65 m.p.h. and will be ready in time to compete in all of the prominent hydroplane races this season. The boat is of the improved Miss Toronto III type. Its performance should be equal to, if not better than Miss Toronto which has a performance of better than 72 miles an hour.

New Building for Topping

A contract has recently been signed by Topping Brothers, heavy and marine hardware jobbers, of 122 Chambers Street, New York, with the White Construction Company for the erection of a four-story and basement reinforced concrete warehouse and office, on the one hundred by one hundred and twenty-five foot corner purchased by Topping Brothers on the corner of Varick Street and Vandam Street, New York, N. Y., from the Trinity Church Corporation.

This building will have 67,000 square feet of floor space, according to the present building plans, and will be constructed so that three additional stories may be added.

A feature of the building will be a 70 x 30-foot loading platform inside the building to expedite the handling of pick-up orders for city deliveries among the trade.

Topping Brothers have been located on Chambers Street for thirty-six years, and the move to their own building on Varick Street will remove another old hardware firm from the district which for so many years was the center of the hardware trade in New York City.

Since the locating of the entrances of the New Jersey Vehicular Tunnel in the Canal and Varick Street section and the widening of the latter street for the building of the Seventh Avenue Subway, there has been a pronounced movement of concerns engaged in the iron and steel and allied lines into this district. Among such concerns which are located in the neighborhood may be mentioned: Crucible Steel Company, Aborn Steel Company, Holcomb Steel Company, Froment & Company, Hazard Wire Rope Company, Union Drawn Steel Company, J. D. Johnson, Niles Bement & Pond, Firth Sterling Steel Company, Chas. Cory, Garvin Machine Company, Lansing & Company, Patriarch & Bell, Peter A. Frasse, Ogden & Wallace, Wheeling Corrugating Company.

Scripps Prices Reduced

Those who have always wanted to own a Scripps motor can now do so for the new low level prices announced by the Scripps Company make this high grade engine available at a price no higher than ordinarily asked for ordinary engines of similar power.

RACING DATES FOR 1921

July 3	Poughkeepsie and return, M. B. C. of Jamacia Bay.
July 1, 2, 4	Mississippi Valley, Annual Regatta, Peoria, Illinois.
July 9	New York Athletic Club, Cruiser Race to Block Island.
July 14, 15, 16	Open Regatta for motor boats, all classes, Baltimore, Maryland.
July 16	New York Motor Boat Club, Race to Newburgh and return.
July 22, 23, 24	Milwaukee, Wisconsin, Motor Boat Races.
July 23	Bridesburg - Columbia Yacht Clubs, Cruiser Race, Bridesburg to Reedy Island and return.
July 30	Colonial Yacht Club, New York, Cruiser Race to Poughkeepsie and return.
Aug. 2	Lake Champlain Yacht Club, Burlington, Vt., Annual Regatta.
Aug. 4, 5, 6, 7	Pageant of Progress Races, Chicago, Ill., all classes.
Aug. 6	New York Athletic Club, Cruiser Championship Race to Shelter Island.
Aug. 11	New York Motor Boat Club, Kieger Trophy Race.
Aug. 11, 12, 13	Fisher Trophy Races at Buffalo, N. Y.
Aug. 13	New Rochelle Yacht Club, Cruiser Race to Stratford Shoal and return.
Aug. 13, 14	Port Washington and return. Rockaway Park Yacht Club.
Aug. 17, 18, 19	Thousand Islands Challenge Cup Races on the St. Lawrence River.
Aug. 20	Orienta Yacht Club, water sports at Lloyd's Harbor, New York.
Aug. 20	Colonial Yacht Club, New York, Cruiser Race to Cornfield Reef Light.
Aug. 27	Harlem Yacht Club, City Island, open races, all classes.
Aug. 27, 29, 30	The Gold Cup, One Mile Championship, and Wood - Fisher Trophy Races at Detroit.
Sept. 3	New York Athletic Club, Navigation Race.
Sept. 5	Wilmington M. B. Club Record Cruiser Trophy Race.
Sept. 3, 5, 6	Races for the British International Trophy at Detroit.
Sept. 5, 6, 7	Motor Boat Races at Toronto.
Sept. 10	Hudson River Yacht Club, New York, Open Races, all classes.
Sept. 10	Philadelphia Y. C., Essington to Reedy Island and return.
Sept. 18	Tamaqua Yacht Club, Ocean Cruiser Race.
Sept. 18	Old Orchard Shoal, Belle Harbor Yacht Club.

Scripps motors for over 16 years have always sold on performance and quality, and the Scripps Company has never found it necessary to resort to the low price appeal, even though their prices have been most reasonable, power, quality, workmanship and equipment all considered.

The very fact, however, that the Scripps has always maintained the highest possible standard of quality, has at times created the erroneous impression that on account of the high quality, price must naturally be equally as high, which is not and has not been the case.

By building a product honestly good throughout and putting the salesmanship into the engine, Scripps business has steadily grown and the strength of this was recently shown by the fact that during the late period of depression when many industries were shut down flat, Scripps production continued on an upward scale, whereby production costs and overhead were kept down to the lowest levels.

The Scripps Company believes in being foremost in meeting present day conditions and now announces new prices, which set a new low level, giving values even better than Scripps pre-war time prices.

The manufacturers emphasize the fact that nothing is reduced but the price, that the quality is even higher than ever before, that refinements and improvements appear in the motor from season to season wherever possible. All the D Series motors are noted for the unusual liberality of crankshaft and bearing sizes, pressure-lubrication throughout, an exceptionally high efficiency in power output and economy.

The new schedule became effective June 1st for the season 1921-22.

Boat-builders, dealers and users are asked to write to the Scripps Motor Company, 5817 Lincoln Ave., Detroit, Mich., for details.

Gray Motors Reduced

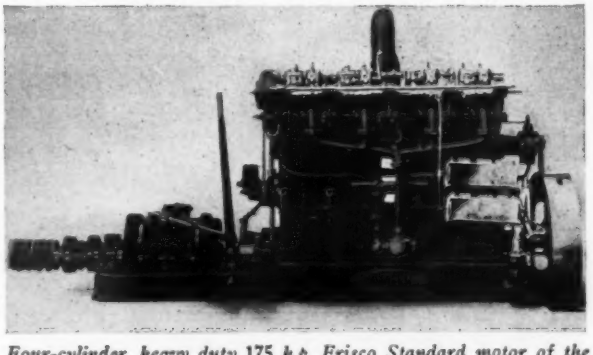
An announcement of the price reduction of the model V M four-cylinder, four-cycle Gray motors went into effect on June 15th. The reduction was a substantial one and brings the price down to the pre-war level.

Palmer Motors Follow Suit

Palmer Brothers of Cos Cob, Conn., have issued a new price list with greatly reduced prices. This is the third cut which has been made in the price of Palmer Motors and brings them back to the early days of long ago. Catalogues and price lists will be mailed to inquiring readers.

Standardized Boats Please Owners

The Central Marine Service Corporation received the letter which follows from a purchaser of one of the standardized Hacker runabouts. Apparently he was pleased with the boat.



Four-cylinder, heavy duty 175 h.p. Frisco Standard motor of the type which is being used extensively on the Pacific coast for passenger and freight boats

"The writer and Mr. Stonestreet have just returned from a trip on the new motor boat. Mr. Stonestreet wanted me to pass my judgment on the boat and I want to express to you my approval of the performance of this boat.

"This boat is more than I expected to see both in performance and construction. Please advise me how quick you could make shipment of one the same as Mr. Stonestreet's, less the top."

The boat in question is one of the standardized runabouts.

A 40-foot high speed runabout which was especially constructed for his majesty Alfonso XIII, King of Spain. This boat was built by the Consolidated Shipbuilding Corporation on the order of the President of the Republic of Cuba by whom it was presented to the King as a token of esteem. The motive power is an eight-cylinder Speedway motor which drives the boat at 30 m.p.h. The entire boat has been finished in the finest materials and furnishings

Good News for Boatmen

Announcement has been made by the National Carbon Company, Inc., Cleveland, Ohio, of a substantial reduction in the price of all standard types of Columbia dry batteries. This reduction in price includes all the brands of dry cells and unit batteries manufactured by the company. The Columbia Ignitor dry cells which are used extensively for motor boat ignition purposes are included in this reduction which will please all the many users of these cells.

Fay and Bowen Still Running

The Fay & Bowen Engine Company tell us that within the past few days they have received an order for a cylinder ring and a small bushing for an engine bearing their serial number 95. On looking over their records they find that this engine is twenty years old and the company can itself trace the engine through the hands of at least four different parties. All of which is pretty good proof not only of the popularity but of the durability of the engines made by the Fay & Bowen Engine Company.

The Trouble Light with the Magnet Grip

This is not a new movie or the title of the latest novel. It is a story containing real facts, of good news for the boatman. The days of tinkering with your motor, holding a light in one hand and working with the other are over. When stalled on a dark night and trying to find out what is the matter with the machine, you will not have to grope around, drop the light you are holding and be forced to cease operations.

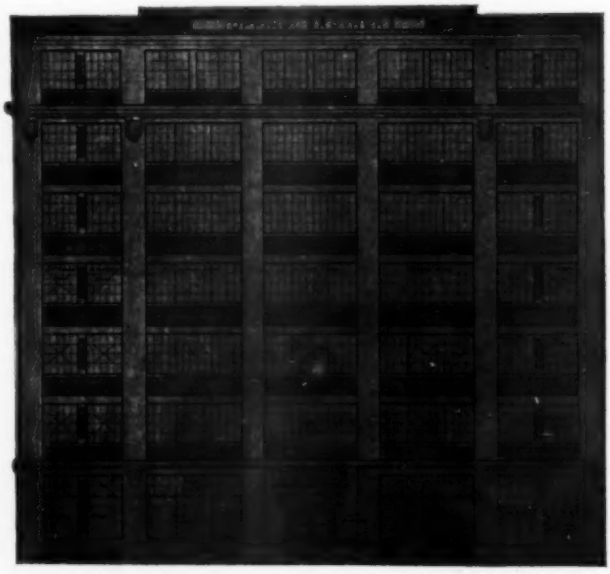
What is known as the Magnet Lite, carrying a 6- or an 8-volt lamp, and protected by a wire guard, has appeared to relieve the boat owner of one of his most serious troubles. The lamp has as a base an electro-magnet that sticks to any metal part of the boat or engine the instant the cord attached to the bulb is plugged in. This cord is 144 inches long, which enables the owner to take the light to almost any part of the boat, rear or front, touch the magnet to any metal part of the boat near where he wishes to work, and the light is there, as bright as day, and he can work with both hands.

When the boatman wishes to fix another part of his engine, he presses a little button, which releases the magnet base but does not put out the light. All he has to do is to stick the magnet base on another part of the engine to which he wishes to transfer his operations and he has his illumination at the right spot.

The police department of Chicago was one of the first public organizations to use the Magnet Lite. It is now a part of the regular equipment of the Homicide Squad car.

"What will be appreciated most in this Magnet Lite," said Edward J. Post, president of the Magnet Light Company, 1509 S. Michigan Avenue, "is the fact that both hands are free. The magnetized base of the lamp will hold the light fast on any metallic object, thus enabling the use of both hands for faster and better work. Anyone who has been stalled on a dark night far from home will appreciate what this means. The length of the cord permits access to any part."

This unique trophy has been presented by Commodore E. L. Kieger for a race from New York to Rockland Light and return. It consists of a relief map to scale of the portion of the Hudson River over which the race is to run, finished in gold and silver



The new factory and warehouse building of Topping Brothers, the New York dealers in heavy marine hardware and ship's fittings

Kermaths in Atlantic Service

The motor boat of the mail steamer Patria, Rotterdam, is equipped with a 10 h.p. Kermath motor. This little motor has performed so satisfactorily that the Captain of the vessel felt it necessary to write the letter below concerning it. He states: "The 10 h.p. Kermath motor installed in the 28-foot motor lifeboat of the twin-screw-geared mail steamer Patria works since two years very satisfactory. The motor is easy to start, simple to operate and has done it in every way. The circulating pump is, however, not of sufficient capacity when the temperature of the sea water raises above 30 degrees centigrade."

When we stop to consider that 30 degrees centigrade the temperature referred to in the letter is equivalent to 86 degrees Fahrenheit we realize that this boat is operating in warm water.

(*Continued on page* 57)

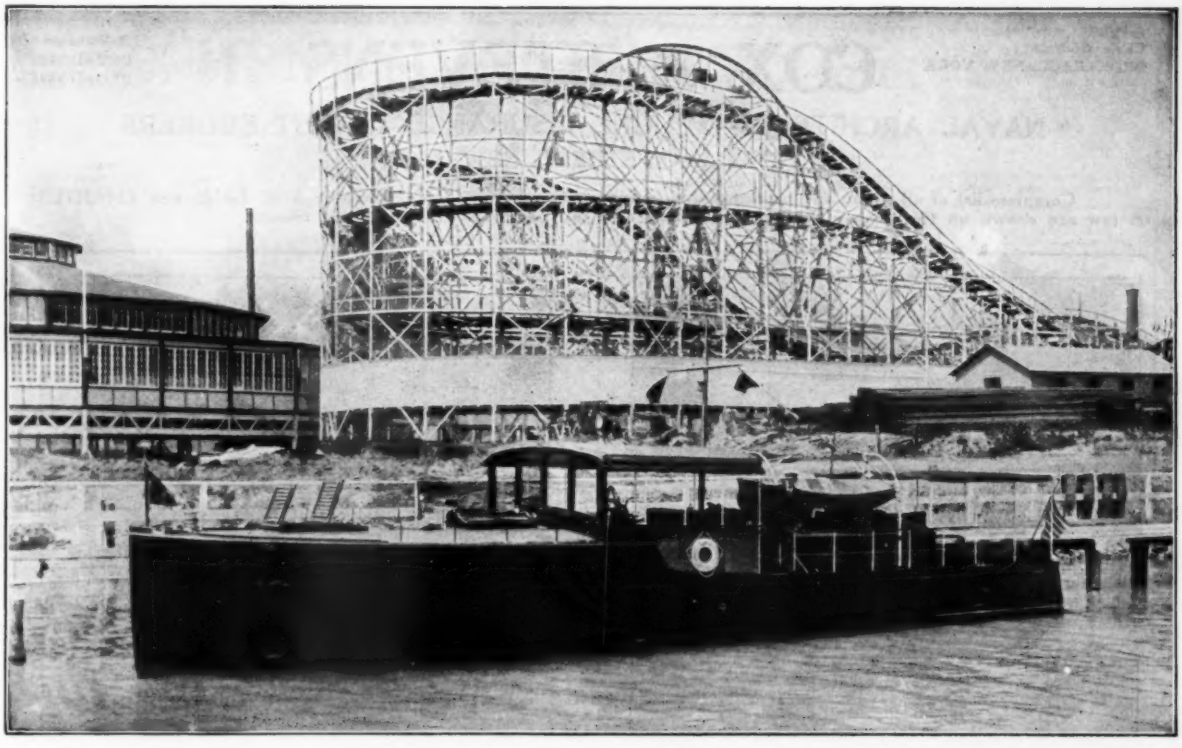


Photo by Manning Bros., Detroit, Mich.

Detroit's latest Cruiser—the Onyx Valsparred, of course!

Here is the express cruiser Onyx, lately added to the Detroit fleet.

Her builders, the Great Lakes Boat Building Corporation, launched her at 4 P. M. on Friday and at 8 P. M. Saturday she left Milwaukee for Detroit, completely equipped. Speedy work, this.

Every refinement which characterizes the fine cruiser is found in the Onyx — every detail of finish carried out to perfection.

No matter what weather the Onyx faces—sun, rain, mist or snow—no matter if oil and gasoline spatter — her owner, Herbert V. Brook, need have no fear for her fine finish. For—to quote the builders—"Valspar Varnish was used throughout in the finish of the Onyx."

Launches to liners—if a boat is worth varnishing, it's worth Valsparring.

VALENTINE & COMPANY

Largest Manufacturers of High-Grade Varnishes in the World—Established 1832

New York Chicago Boston Toronto London Paris Amsterdam

W. P. FULLER & Co., Pacific Coast

VALENTINE'S VALSPAR

The Varnish That Won't Turn White

VALENTINE & COMPANY, 456 Fourth Ave., New York

Special Offer

For your dealer's name and 15c in stamps, we will send you a 35c sample can of Valspar—enough to finish several square feet of surface. Fill out coupon.

Dealer's Name.....

Your Name.....

Your Address.....

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Cable Address:
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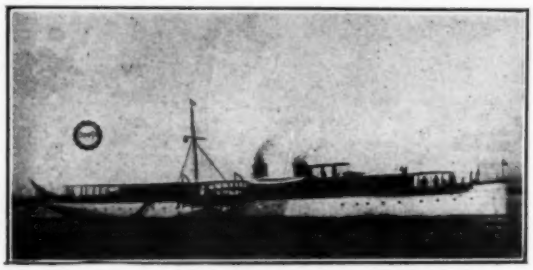
COX & STEVENS

Telephones:
BROAD 1924
BROAD 1375

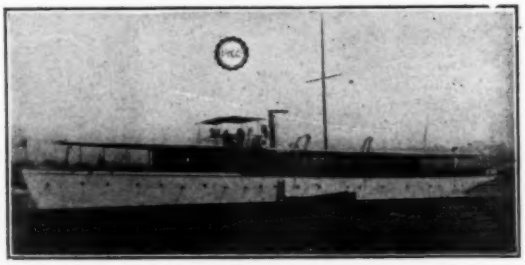
NAVAL ARCHITECTS—MARINE INSURANCE—YACHT BROKERS

15 WILLIAM STREET, NEW YORK

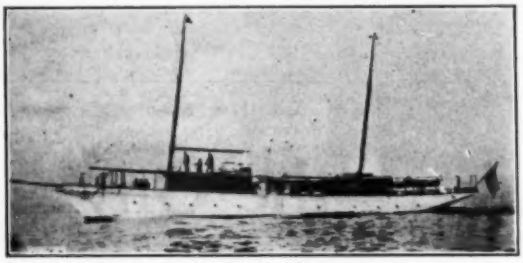
Complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.



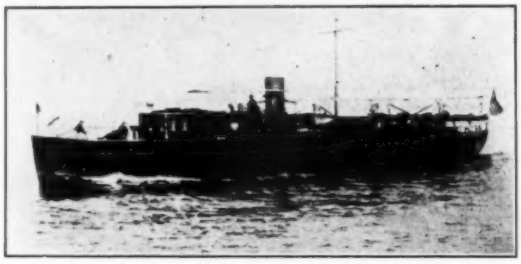
No. 3047—For Sale—Particularly attractive 165 ft. fast oil-burning twin-screw, steel steam yacht. Speed up to 19 miles. Beautifully finished and furnished. Large accommodation includes dining saloon and music room on deck, six staterooms and three bathrooms below aft. Cox & Stevens, 15 William Street, New York.



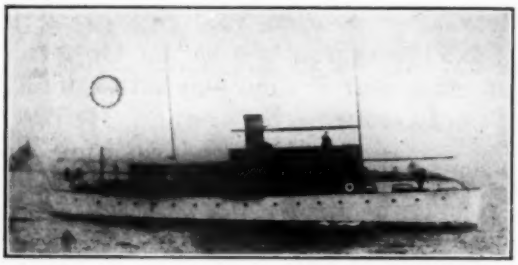
No. 1466—For Sale or Charter—Particularly desirable 140 ft. twin-screw steel cruising power yacht. Speed up to 18 miles; two 300 H.P. Standard motors. Dining saloon and social hall on deck; 3 double and 1 single staterooms, 3 bath and toilet rooms, etc. Recently overhauled thoroughly at large expense. In splendid condition. Cox & Stevens, 15 William Street, New York.



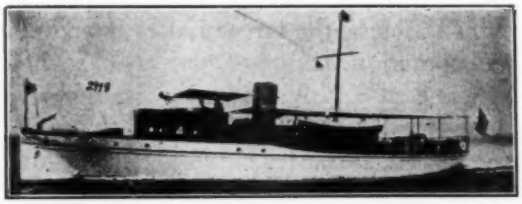
No. 40—For Sale or Charter—Flush deck steel steam yacht, 140 x 18 x 7.6 ft. draft. Has two deck houses, after one being used as a social hall. Quarters handsomely furnished and well laid out. Boiler and engine new 1916. Speed up to 14 miles. Cox & Stevens, 15 William Street, New York.



No. 2666—For Sale—Twin-screw cruising power yacht; 100 x 16.6 x 4.6 ft. Speed 10-11 miles; two 60/70 H.P. "20th Century" Motors. Dining saloon in deckhouse, three double and two single staterooms, main saloon, bathroom and two toilets, galley on deck, etc. Exceptionally roomy craft. Beautifully finished. Cox & Stevens, 15 William Street, New York.



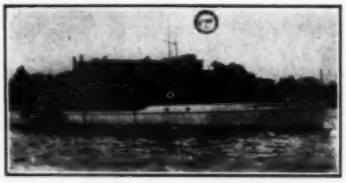
No. 2247—For Sale or Charter—Able twin-screw cruising power yacht; 89 x 15.3 x 4.9 ft. draft. Speed 12 miles. Two 80 H.P. Winton motors. Dining saloon, main saloon, three staterooms, two bathrooms and three toilets. Excellent condition. Low price. Cox & Stevens, 15 William Street, New York.



No. 2978—For Sale—Desirable twin-screw cruising power yacht; 80 x 14 x 4 ft. Speed 13 miles; two 50/60 H.P. Twentieth Century motors new 1919. Dining saloon, two double staterooms, bathroom and two toilets, galley, etc. Recently thoroughly overhauled at large expense. Cox & Stevens, 15 William Street, New York.

No. 3151—For Sale or Charter—Particularly desirable twin-screw houseboat; 77 x 17.6 x 3 ft. Speed 11 miles; two 6 cyl. 60-70 H.P. Standard motors new 1919. Large deckhouse containing social hall; main saloon, two double and two single staterooms, two bath and toilet rooms, etc. Handsomely finished and furnished. Cox & Stevens, 15 William Street, New York.

No. 3477—For Sale—Fast bridge deck cruiser; 43 x 9 x 3.6 ft. Speed up to 17 miles; 130/150 H.P. 6 cyl. Speedway Motor. Saloon, double stateroom, two toilets, galley, etc. Splendid boat for ferry or day service. Price low. Cox & Stevens, 15 William Street, New York.



No. 2714—For Sale—Cruising power yacht; 62 x 11.6 x 3.9 ft. Speed 11 miles. 40-60 H.P. motor. Two saloons each with two berths. Double stateroom, bath and toilet room. Handsomely finished. Bargain for quick sale. Cox & Stevens, 15 William Street, New York.

Advertising Index will be found on page 118

NAVAL ARCHITECTS
ENGINEERS
YACHT BROKERS
MARINE INSURANCE

HENRY J. GIELOW, Inc.

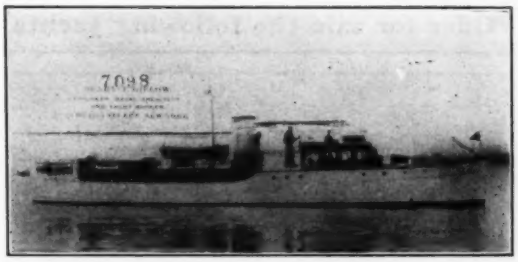
25 WEST 43rd STREET, NEW YORK

Tel.: Murray Hill 9134
Cable Address:
Crogie, New York
A.B.C. Code

Plans and specifications for new yachts of any size or type should be prepared now to assure delivery for next year. Have plans of new yachts, all types, on file now.

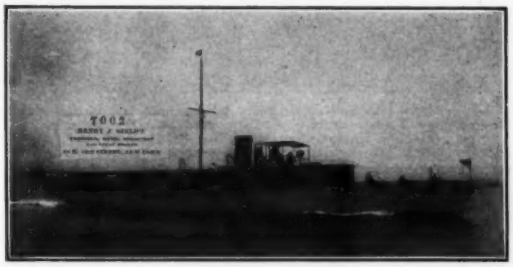
We have a most complete and up-to-date list of steam and motor yachts of all sizes, sail, auxiliary, and houseboats on file in our office, kept constantly up-to-date by a thorough and comprehensive canvass of the entire yachting field from time to time. We are in a position to submit full information on any type of boat upon request.

No. 8165—For Sale—Consider 50-60 ft. auxiliary part payment. New houseboat 45 x 13 x 3. Speed 9 miles. In commission. Double and single stateroom, saloon and bath. Also deck saloon. Delco lighting plant. All complete and perfect condition. Henry J. Gielow, Inc., 25 W. 43rd Street, New York City.

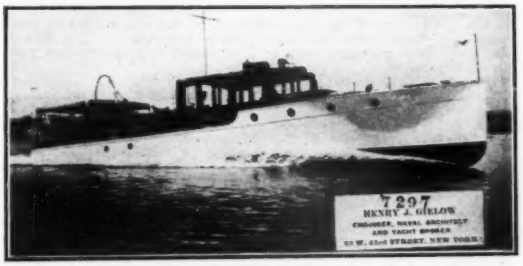


No. 7098—For Sale—Bargain modern 72 ft. Lawley built twin-screw motor yacht of recent build. Speed 12 to 14 knots; two 6 cyl. 150 H.P. Winton motors. Two double staterooms, bathroom and two toilets. Deck dining saloon. Owner anxious to sell. Henry J. Gielow, Inc., 25 W. 43rd Street, New York City.

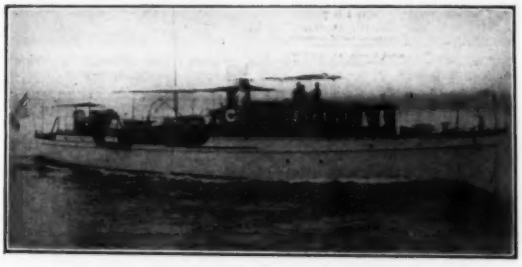
No. 8080—For Sale—Charter—New modern 85 ft. twin-screw cruising houseboat. Deck dining saloon and galley. 2 double, 3 single staterooms. Hot water heat, 3 baths. Shoal draught makes attractive type Florida cruising. Two 50 horsepower motors give speed 10 miles. Good sea boat. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.



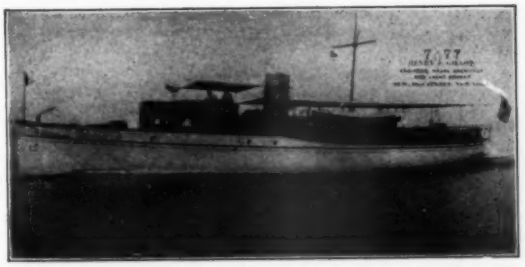
No. 7002—For Sale or Charter—Finest yacht of type available. 138 ft. twin-screw power yacht. Two 300 H.P. Standard engines. Dining room and social hall on deck; three double and one single staterooms; two bathrooms. All furnishings new 1920. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.



No. 7297—For Sale—Attractive high grade 48 ft. twin-screw express cruiser. New Van Blerck motors and upholstery 1920. Speed 21-24 miles. Excellent sea boat through shoal draught, and desirable for Southern and Northern use. Two cabins and separate galley. Crew forward. Bridge deck enclosed in removable glass partition. Cockpit aft. Modern in all appointments. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.



No. 7040—For Sale—Bargain—Modern Lawley built 96 ft. twin-screw motor yacht. 15 ft. beam. Standard motors. Speed 11 miles. Deck dining saloon, 2 double staterooms. Accommodate seven. Economical, can run with 4 crew. Able sea boat. Furnishings new 1919, includes player piano. Large bridge and good deck space. Fine condition. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.



No. 7077—For Sale—Particularly desirable 80-foot twin-screw power yacht. "20th Century" 50/60 H.P. motors, new 1919. Deck dining room, two double staterooms, bathroom. All furnishings and equipment new 1919. Excellent condition. Henry J. Gielow, Inc., 25 W. 43rd St., New York City.

No. 7165—For Sale—Finest and roomiest 66' raised deck cruiser, two double staterooms, bathroom, large deck dining saloon, unusual amount of deck space, equipped with new 75 H.P. motor, interior finished in mahogny and cream. Excellent sea boat. Owner has purchased larger yacht, act quickly. Henry J. Gielow, Inc., 25 West 43rd Street, New York City.

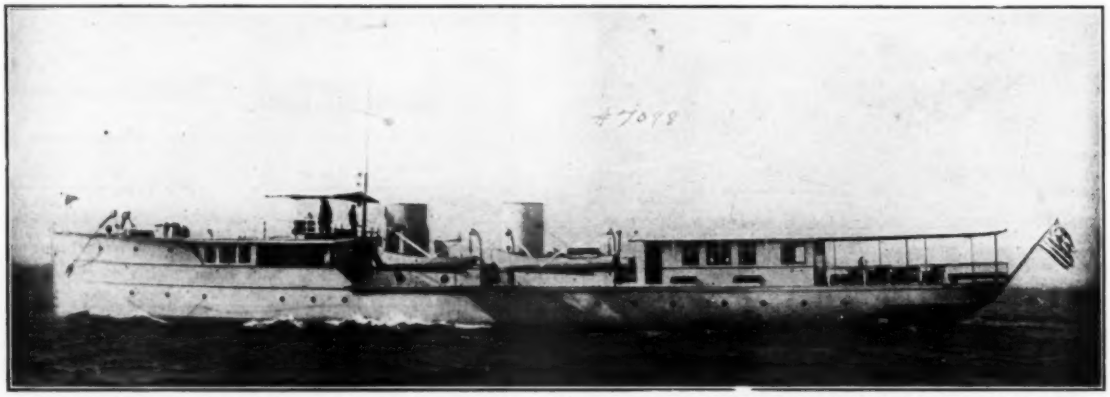
TAMS, LEMOINE & CRANE

NAVAL ARCHITECTS AND YACHT BROKERS

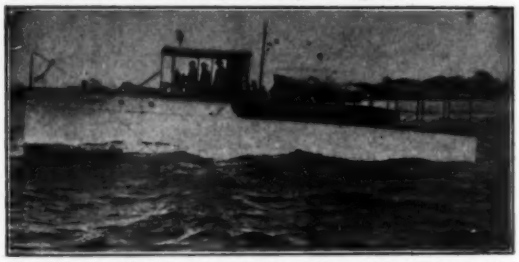
Telephone 4510 John

52 Pine Street New York City

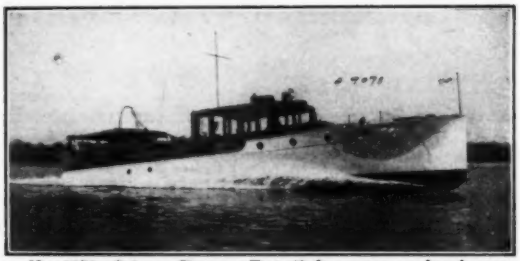
Offer for sale the following yachts, some of which are available for charter



No. 7098—Unusual opportunity to purchase the largest cruising steel motor yacht afloat—140 ft. overall—19 ft. 6 in. beam—6 ft. 6 in. draft. Designed by Tams, Lemoine & Crane and built by Lawley. An exceptionally able yacht. Triple screw having three 6 cylinder. Speedway motors. Gasoline consumption low. Speed 16 miles per hour. Large cruising radius. Has very commodious owners' quarters attractively fitted and furnished. In absolutely A-1 shape throughout.

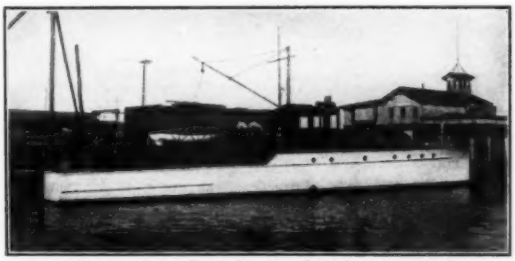


No. 7474—Sale—Brand new fast cruiser; 2-6 cylinder Sterling motors. Speed 21½ miles. All modern conveniences.

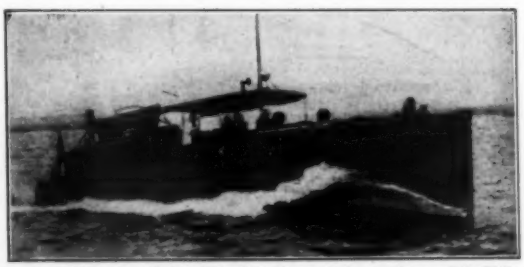


No. 9078—Sale or Charter—Fast 48 ft. express cruiser in commission. Immediate delivery—2 new 6 cylinder Van Blerck motors. Good accommodations. Thoroughly overhauled last year in all departments.

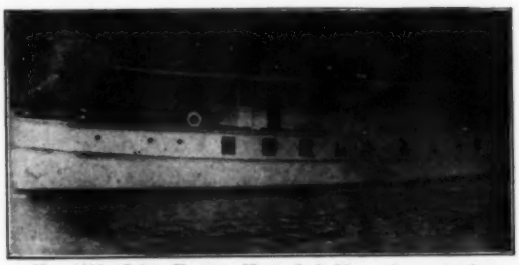
No. 8102—Sale—Charter; most desirable raised deck cruiser available. Practically new. 81 ft. x 13 ft. x 5 ft. draft. Speed 15 miles. Electric light, hot water, heat and refrigerating plant.



No. 9075—For Sale—Desirable raised deck cruiser 70 ft. x 11 ft. x 4 ft. Good accommodations. Speed 23 miles.



No. 8978—For Sale—Raised deck semi day cruiser. 200 H.P. Sterling motor. Speed 20 miles per hour. In the very best of condition. Price reasonable. Full particulars and plans from Tams, Lemoine & Crane, 52 Pine Street, New York.



No. 1927—Sale—Charter—Very desirable, twin screw houseboat; 5 staterooms, 3 bathrooms, dining saloon, lighted by electricity and hot water heat.

Advertising Index will be found on page 118

EDWARD P. FARLEY CO.,

6 N. Michigan Avenue, Chicago, Ill.
Telephone State 6494

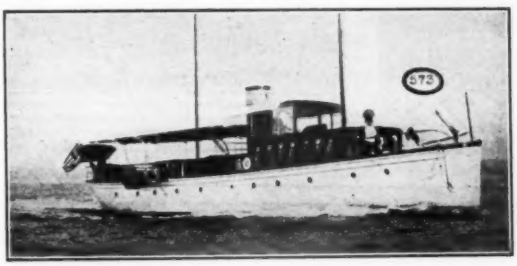
Naval Architects, Yacht Brokers, Surveying, Marine Insurance

We have a complete list of all Steam and Power Yachts, Auxiliaries and Houseboats which are offered for sale and charter

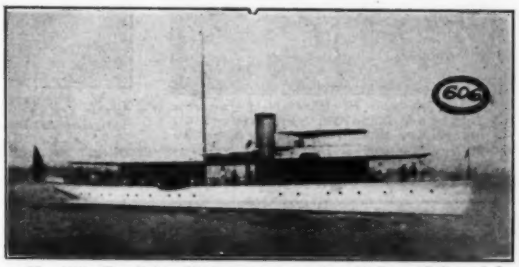
Plans, Photographs and full particulars furnished on request.

No. 971—For Sale—32 ft. Speedway runabout. Equipped with 40 H.P. Speedway motor. Speed 18 miles. Completely equipped with top, windshield, etc. Excellent condition. Edward P. Farley Company, 6 North Michigan Avenue, Chicago, Ill.

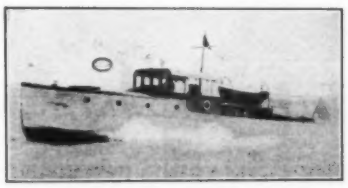
No. 26—For Sale—100 ft. twin-screw power yacht of recent construction and thoroughly modern in all details. Has exceptional accommodations consisting of three double and two single staterooms, dining saloon in deckhouse forward. An able and comfortable cruiser. Edward P. Farley Company, 6 North Michigan Ave., Chicago, Ill.



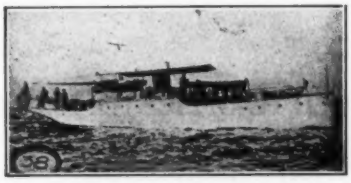
No. 573—For Sale—91 ft. x 14 ft. x 4 ft. 3 in. twin-screw gas yacht. Built 1917. Winton motors. Speed up to sixteen miles. Roomy accommodations with every convenience. In excellent condition. Equipment of the best. Edward P. Farley Company, 6 North Michigan Ave., Chicago, Ill.



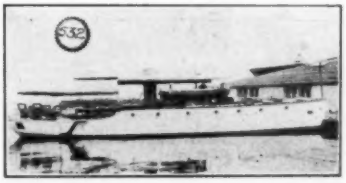
No. 606—For Sale—Modern steam yacht, 123 ft. x 17 ft. x 6 ft. draft. Speed up to sixteen miles. Three single and two double staterooms. Dining and social hall on deck. In excellent condition throughout. The finest yacht of her size available. Edward P. Farley Company, 6 North Michigan Ave., Chicago, Ill.



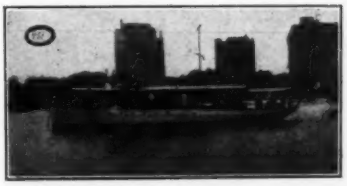
No. 1018 — For Sale — 54 ft. twin-screw cruiser, express type. Speed 21-24 miles per hour. Two double staterooms, main saloon, two toilets, etc. Complete equipment. Edward P. Farley Company, 6 N. Michigan Ave., Chicago, Ill.



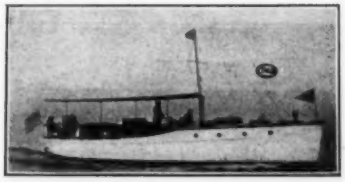
No. 38—For Sale—78 ft. Lawley built cruiser. Winton motor. Two commodious double staterooms. Two toilets. Dining saloon in deckhouse forward. A very able and modern boat. Edward P. Farley Company, 6 North Michigan Avenue, Chicago, Ill.



No. 532—For Sale—71 ft. twin-screw flush deck motor yacht. Built by Seabury. Motors controlled from deck. Accommodations consist of one double stateroom, large main saloon, bath, etc. Attractive price. Located Great Lakes. Edward P. Farley Company, 6 N. Michigan Ave., Chicago, Ill.



No. 451—For Sale—85 ft. x 15 ft. 6 in. x 4 ft. power yacht. Attractively furnished and fitted throughout. Equipped for extensive cruising. Two double and one single staterooms, bath, etc. Has deck social hall. (Located Great Lakes.) Edward P. Farley Company, 6 North Michigan Avenue, Chicago, Ill.



No. 768—For Sale—A 45-ft. Elco cruiser of excellent construction. Fully equipped for cruising. Accommodations consist of double stateroom aft; main saloon forward, with four berths, two toilets, large galley, etc. Motor controls from bridge.

HENRY H. JENNINGS HERMAN JAGLE

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TRIBUNE BUILDING

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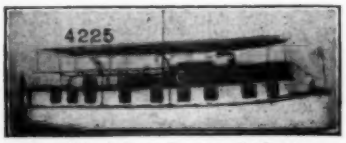
Marine Insurance

Our 25 Years' Experience and Our Knowledge of the Yachts We Offer, Insure Satisfaction to Clients

No. 1525—43 foot cruiser. Four berths in main cabin and one in engine room. Toilet, etc. 24-30 H.P. 20th Century motor. 4 cylinders. Speed 9-10 miles. Electric lights, etc.



No. 4225—Sale or Charter—51 foot power houseboat. Three staterooms, main saloon, toilet. 32-37 H.P. Standard motor. Speed 8 miles. Electric lights. Very comfortable boat.

No. 2093—52 foot express cruiser. Double stateroom. Main cabin with four berths. Two toilets. Two berths and toilet for crew. 200 H.P. Sterling motor. Speed 24 miles.

No. 4322—Sale or Charter—Twin-screw 85 foot power houseboat. Five staterooms, dining saloon, three baths, etc. Speed 10 miles.

No. 1899—63 foot power yacht. One double and one single stateroom. Two Pullman berths in saloon. Toilet and bath. 70-90 H.P. Standard motor. Speed 15 miles. Electric lights, etc.

No. 2136—Sale or Charter—Twin-screw 80 foot power yacht. Two double staterooms, dining saloon, etc. Two 220 H.P. Standard motors. Speed up to 21 miles.

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YACHT BROKERAGE — NAVAL ARCHITECTURE — MARINE INSURANCE

Telephone 1170 1171 Whitehall

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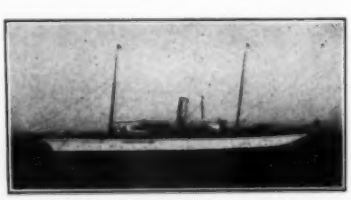
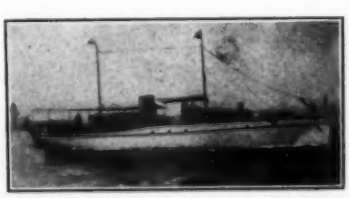
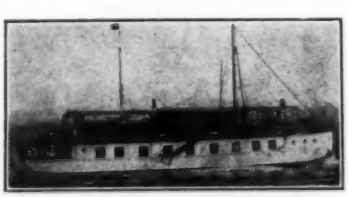


No. 1236—200 ft. steel sea going steam yacht. Best design and build. A-1 condition throughout. Oil burning. One of the finest vessels in the fleet. Frank Bowne Jones, Yacht Agent, 25 Broadway, New York.



No. 3413—80 ft. twin screw cruising gas yacht. Lawley build. Practically new. Frank Bowne Jones, Yacht Agent, 25 Broadway, New York.



No. 4084—For Sale or Charter—One of the Mathis 75 ft. power house yachts. Exceptional accommodations. Splendid motors. In commission. Frank Bowne Jones, Agent, 25 Broadway, New York.

Advertising Index will be found on page 118

WILLIAM GARDNER
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WILLIAM GARDNER & CO.

PHILIP LEVENTHAL
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Naval Architects, Marine Engineers and Yacht Brokers

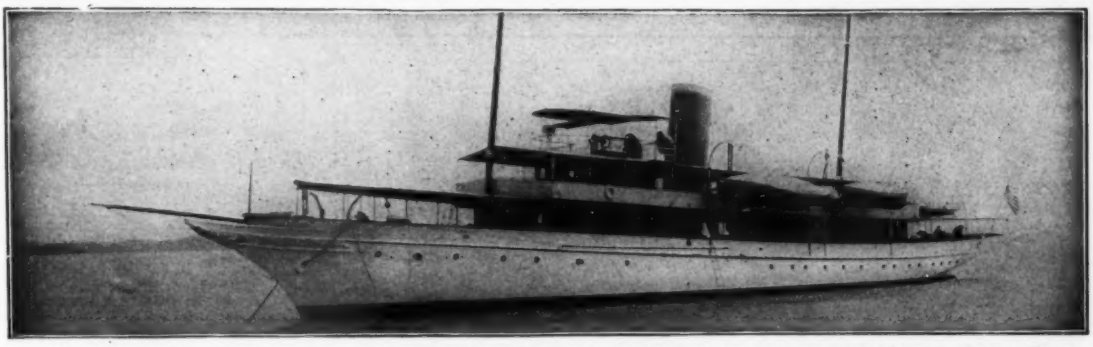
Telephone Call
8638 Bowling Green

1 Broadway, New York

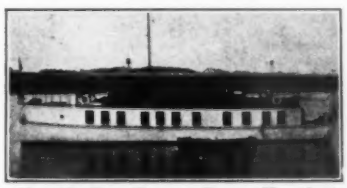
Cable Address
Yachting, N. Y.

We have a complete list of Yachts of every description for sale and charter

Plans, Photos and full particulars furnished on request.



No. 659—Steel steam yacht, deep sea type, 187 x 24 x 10. Of best construction throughout, and of recent build from our designs. Promenade deck full width of boat. Has two large deck houses, with chart house and Captain's room on upper deck. Finely appointed owner's and guests' quarters. Was not used in Government Service. In best possible condition and should be seen to be fully appreciated. Inspection invited.



No. 37—For Charter—Power Houseboat 70 x 16.9, new Sterling motors installed, four double staterooms, two bathrooms, etc. Commodious deckhouse.

No. 2345—Patrol type. Twin-screw express cruiser, 60 x 10. Two six cylinder motors. Speed 25 knots. Very reasonable figure.

No. 2044—Bridge deck cruiser, 63 x 13.6 x 4. Twentieth Century motor, 4 cylinder Speed 11/12 miles. Attractive interior arrangement.

For Sale—By Owner—Raised deck cruiser, 65 ft. x 14 ft. 3 in. x 3 ft. 6 in. Six cylinder Standard 6 x 8 engine. Separate electric plant. Hot water heat. Combined deck and pilot house. Cruising speed ten miles. Large galley. Two double state rooms. Big engine room. Forward cabin. Two toilets. Comfortable accommodation for eight. Fully and expensively equipped. Five years old. Guaranteed to be sound, sea-worthy and in perfect condition. In commission, ready and able to go anywhere. Just in from seven hundred mile cruise. Nothing better afloat of her size. Inspectable Virginia waters. Price one-third her real value. Address 7-B Monroe Terrace, Richmond, Virginia.

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For Sale

Small double ended propeller ferry boat, new. Diesel engine, cost of fuel sixty cents (60c) per hour under full load.

The New London Ship & Engine Co.

Groton Conn.

REBUILT MOTORS

The Engine You Want at the Price You Want to Pay

We carry in stock inboard and outboard motors ranging from 1 to 600 H.P., of all types. These machines are honestly rebuilt in our own shops and sold with an IRON-CLAD GUARANTEE. We recently announced a reduction of 20% in the price of these engines, which brings the prices in most cases down to about 40% of Their Original Cost.

Write us for our Bargain List—it will be sent anywhere on request.

BRUNS, KIMBALL & CO.

153-155-157-159 West 15th Street New York City

We also are distributors of and carry a stock of the following NEW motors —the finest built in this country—

Sterling	Kermath	Murray & Tregurtha	Missouri
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Peterborough Canoe Co., Ltd.

Peterborough, Canada

HIGH GRADE MOTOR CRAFT

16-foot, 18-foot, and 20-foot stock models for prompt shipment.

CANOES SKIFFS
OUTBOARD BOATS

Ontario Distributors of Evinrude Motors.

Our plant is situated on the famous Trent Waterways.

We are in a good position to take care of any orders from tourists in Canada and to give prompt service and delivery to any part of the Dominion.

THE MOTOR BOATING MARKET PLACE

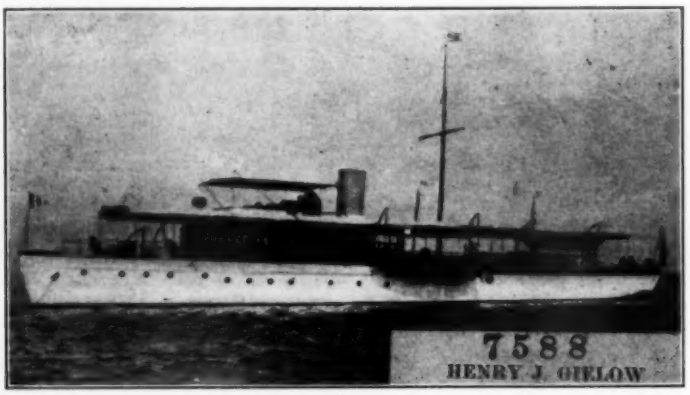
The rate for "For Sale" and "Want" advertisements is 6 cents per word, minimum $1.50. If an illustration is used, the charge is as follows, which includes the making of the cut:

Cut one inch deep, one column wide..... $ 5
Cut 1½ inches deep, 1½ columns wide..... $10
Cut 2¾ inches deep, three columns wide..... $20

Terms: Cash with order.

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatinG.



No. 7588—For Sale—Luxuriously furnished, 110-foot twin-screw steel power yacht. Speed 12 knots. Two exceptionally large and roomy staterooms, tiled bathroom, splendid living room, fine big deck dining saloon. Interior finish in mahogany and creamed enamel, decorated in gold. Inspection and trial run in New York. Owner anxious to sell. Apply Henry J. Gielow, Inc., 25 W. 43rd St., New York City.

For Sale or Charter—New express cruiser, 40 ft. x 10 ft. x 2 ft. 6 in. draft. Very seaworthy. Guaranteed speed 25 M.P.H. Twin-screws. Two independent power-plants. Electric starters and lights. One man control. Highly finished, mahogany trimmings, and fully equipped. Sleeps six. Contracted to sell for $12,000.00, will sacrifice same for $8,000. Ventnor Boat Works, Atlantic City, N. J.

Model speed boating is great sport. We have the motive power for your boats. Our engines and parts are masterpieces of workmanship—accurate in every detail. Single cylinder oscillating engines, $5.50 to $6.50. Twin cylinder oscillating engines, $7.50. Double acting slide valve and slide crank vertical engines, with or without trunk cross head slide, $18.00-$21.50. Separate boilers, vertical or horizontal, complete with fittings, firebox and alcohol lamp, $15.50 up. Propeller shafts, rigid and flexible, 75c and $1.00. Have a speed boat of your own. Try our steam engines. Send 10c for details and catalog. Model Makers Supply, 505 Fifth Avenue, New York.

Write for special lists—Power cruisers, all sizes. Aux-yawls, sloops and schooners. Also without power. Strong & Beekman, 29 Broadway, New York.

For Sale — Knox Motor, single cylinder 2 cycle, 7½ H.P. with propeller. $100. E. A. DeWolf, 10 So. Sixth St., New Bedford, Mass.

Captain desires berth, Masters Steam License. Gas, sail, steam yacht. Well acquainted waters New York, Boston, etc. First class pilot license Miami Bars harbors, Hawks channel, Key West, Florida Keys. Inside route Florida, West Indies, Atlantic Coast and tributaries. Highest credentials. Year around preferred. Also deliver and pilot yachts anywhere. Captain Jennison, care of MoToR BoatinG.

For Sale—Powerful eight-inch "Neverout" gas searchlight. Has Mangin mirror lens reflector. Operated by hand turning on swivel to any desired angle. Bargain at $20.00. Address B. M. Tucker, 960 Madison Ave., Albany, N. Y.

Want to purchase schooner suitable for carrying coal. Two to three hundred tons deadweight capacity. One with small auxiliary power preferred. State terms first letter. P.O. Box 1246, New Orleans, La.

Wanted—One second hand engine, heavy duty, about 50 H.P. Kahlenburg preferred. J. L. McCann, Box 5, St. James, Mich.

One 215 H.P., 8-cylinder, high-speed Van Blerck motor, two years old. Rebuilt and guaranteed. $1200. In stock. Bowler, Holmes & Hecker Co., Inc., 259 Greenwich St., New York City.

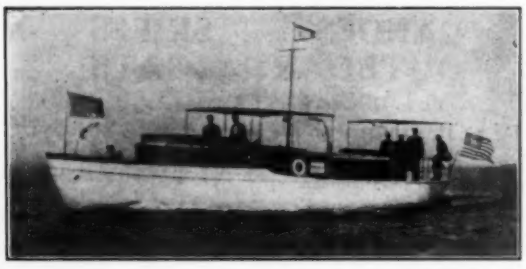
For Sale—Motor boat or exchange for larger boat. A 29 ft. 6 in. x 8 ft. 8 in. trunk cabin cruiser. Large cockpit. Fully equipped. Henry C. Peppers, 2579 Atlantic Ave., Brooklyn, N. Y.

Wanted—Steam Yacht in exchange for my Ohio Farm. W. J. Melvin, room 219, 108 So. LaSalle St., Chicago.

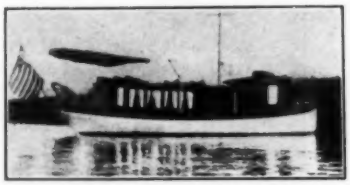
For Sale—Raised deck cruiser, cypress, 30 ft. x 9 ft. 4 cylinder 40 H.P. Lathrop. Dual ignition, self starter. New 1920. Speed 12-14 miles. Electric lights. 2 beds and 6 cots. Ice box, toilet and kitchenette. Price $2500. Inspected at Barnegat, N. J. Milton Stern, 910 Park Row Bldg. Phone Barclay 8254.

One 4 cyl. 4 cycle Big Four tractor motor, 6½ x 8, 2,000 lbs. Governor control. Kerosene attachment. KW high tension magneto. Perfect condition. Price complete less reverse gear, $585.00. Would consider trade. 150 H.P. eight cyl. 4 cycle air cooled aeroplane motor, V type, 4¼ x 5. Weight 600 lbs. with two 8 ft. propellers, $285.00. Would consider trade. Our latest list—500 engines—marine, auto, tractor, aero, stationary types, just completed. Send for copy, it's free, and state your power requirements. We buy engines, and take them in trade on new or used standard makes. The Badger Motor Co., Milwaukee, Wis.

Berry Brothers, Detroit, have for sale two Van Blerck motors, one L4, four cylinder. RH 80/106 H.P. One L-6, six cylinder 122/140 H.P. 1000 to 1500 RPM.



For Sale—Elco Bridge deck cruiser, 52 x 11.3 x 3.7 Standard motor, accommodations for six, exceptionally well found, new Delco lighting system, everything in first class condition. Owner will accept reasonable offer. For further particulars apply RIGG & WETHERILL, Yacht Brokers, Bellevue Court Bldg., Philadelphia.



For Sale—50 ft. glass cabin cruiser. Seabury built. Speedway motor. 40-50 H.P. Finished in solid mahogany, new copper sheeted bottom. In A1 condition. Speed 13-14 miles. Ready for any demonstration. Henry C. Granneman, 238-55th St., Brooklyn, N. Y.

For Sale—Three motor boats at reasonable prices. Express Runabout, glass cabin hull 35 ft. x 7ft., six cylinder motor 4¼ in. x 5½ in. Open Runabout, hull 28 ft. x 4 ft., four cylinder motor. Open Launch, hull of steel 16 ft. x 4 ft., single cylinder motor. These boats are in A1 condition and may be inspected in commission or photos will be sent upon request. Address Motor Boat. 105 Willard Ave., Bloomfield, N. J.

For Sale—Able deep sea cruiser, 43 ft. 0 in. x 10 ft. 6 in. x 3 ft. 6 in. Designed and built by Nock, 40 H.P. Sterling heavy duty motor. Speed eleven miles. Two cabins, sleeps six passengers. Berth for man in engine room. First class condition throughout. Full equipment for cruising. In commission at New Rochelle on Long Island Sound. For particulars address J. H. Wallace, 5 Beekman Street, New York.

Save money by getting our list of engines. We are allowing 25% discount. List contains 62 engines from 1 to 65 H.P. Jesiek Boat Company, Grand Rapids, Michigan.

For Sale—Auxiliary cruiser. 2 masts. Chesapeake rig with center board. 60 ft. long, 17½ ft. beam, 3½ ft. draught. 25 net tons. Condition perfect. Rebuilt and equipped. Large saloon, 2 double staterooms, 2 large saloon berths, 2 crews' staterooms; bath and 2 toilets; large galley; also engine room. Unusually comfortable and commodious throughout. Engine 4 cylinder 40 H.P. double ignition and magneto. Speed with engine 9 miles. 1 power tender and 1 sail tender. Unusual bargain. Address "Baltimore," care of MoToR BoatinG, 119 West 40th Street, New York City.

Passenger or tug boat engine, 4 cylinder, 4 cycle 7 in. bore 9 in. stroke, 30 to 40 H.P. Slow speed. Heavy duty type. Complete with reverse gear. Ignition system. Schebler carburetor and propeller wheel. Good running order. Price, $600.00. Two cylinder 12-16 H.P. Smalley with Schebler carburetor. Good running order, $150.00. Two cylinder 6 H.P. Gray, not overhauled, $45.00. Single cylinder 2½ H.P. Royal engine, not overhauled, $25.00. Gray Motor Corp., Detroit, Mich.

For Sale—40 ft. 5 in. x 6 ft. 9 in. mahogany runabout "Chinook", speed 25 M.P.H. Equipped with six cylinder 5½ x 6 Van Blerck engine, electric starter, generator, electric lights, windshield, upholstered seats, top and curtains. Boat is in excellent condition and immediate shipment can be made to any point desired. Value $7,500.00; will sell for $5,000.00. Address Winton Engine Works, Cleveland, Ohio.

I have a few pair of Bausch & Lomb 6 x 30 power, prism binoculars and will sell them for about one-half of the regular price—this is a wonderful opportunity for yachtsmen to get a good pair of glasses. Percy M. Child, 1110-14th St., N.W., Washington, D. C.

For Sale: 1. 2KW Carlisle & Finch direct connected lighting plant, and 1, 5 KW Winton direct connected plant; also 1-18 in. and 1-14 in. Rushmore searchlight and one 9 in. all brass-stand deck type yacht searchlight, and a few 150 lb. mushroom anchor. Percy M. Child, 1110-14th St., N.W., Washington, D. C.

Gentlemen's high class runabout—25 ft. 50 h.p. 8-V-type motor, with electrical starter. Everything new, excellent running order. Speed 21 miles. Also seaworthy. Will sell at price offered. See this boat before purchasing another. Wonderful bargain. J. E. Wicks, 263 Dean St., Brooklyn, N. Y. Telephone Chelsea 2583.

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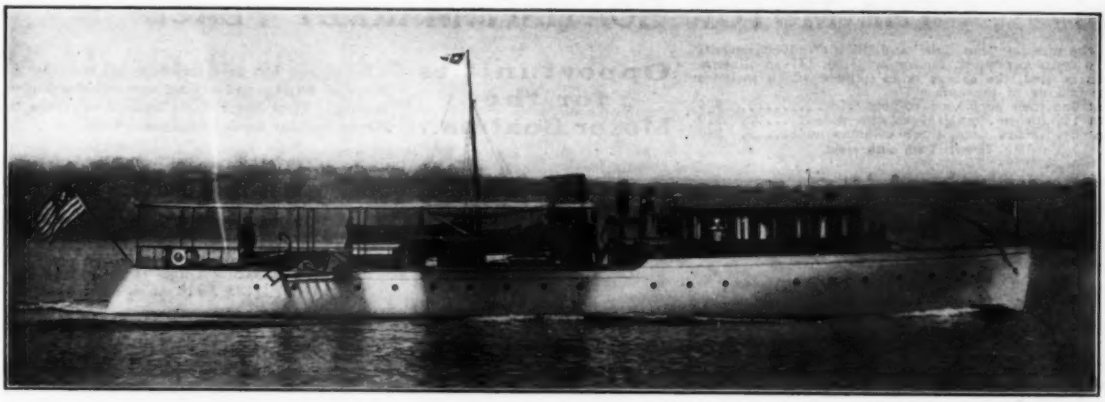
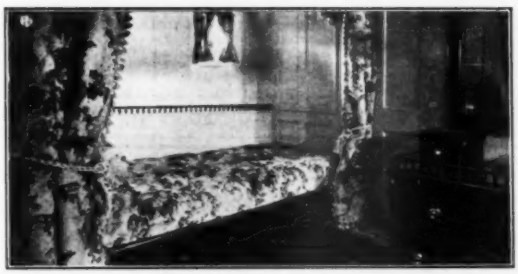
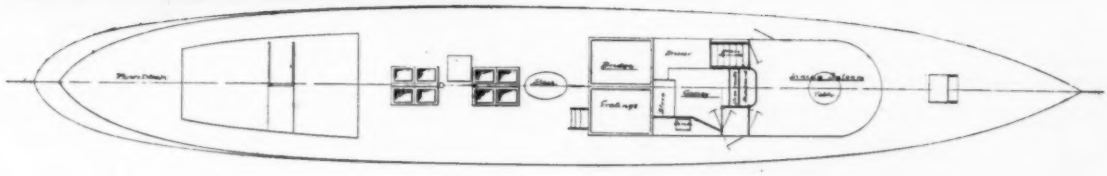
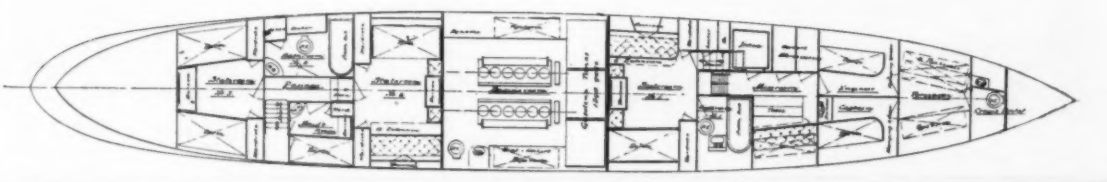




No. 979—Unusual opportunity to purchase high grade cruising yacht. Twin-screw, 98 feet over all, 15 feet beam, 4 feet 6 inches draught. Has two 125/150 H.P. 6 cylinder air-starting reversible Standard motors; a 4 K.W. direct-connected independent lighting plant, new 100-cell Edison storage battery. Is electrically equipped throughout, also ventilating fans and electric windlass. Remarkable accommodations include dining saloon and galley on deck; three double staterooms and one single stateroom; two bath rooms. Interior views show dining saloon and owner's stateroom. Hull, also power and light plants, thoroughly reconditioned in 1920, when yacht was entirely refurnished. For further particulars and inspection apply to Cox & Stevens, 15 William Street, New York. Telephone 1924 Broad.





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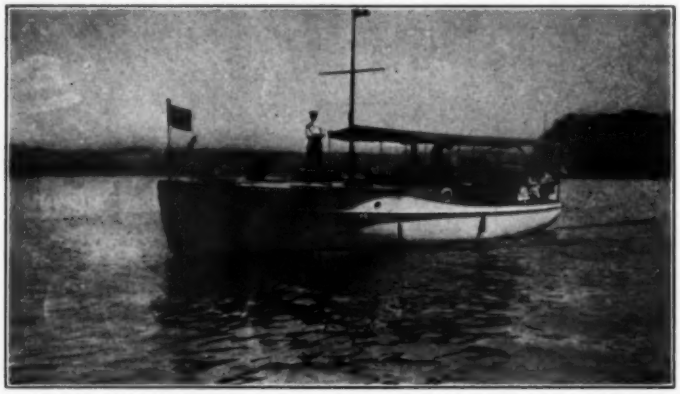


For Sale—Beautiful Elco built Bridge deck cruising yacht 45 ft. x 10½ ft. x 3½ ft. Speed 11 miles. Practically new and in perfect condition. Used only three seasons. Four cylinder 37 H.P. Standard engine. Electric starter. Triple ignition one man control from bridge. Delco lighting plant. Searchlight, wind shield, combined binnacle and wheel. Elaborate full sized chart table with charts on rolls from Boston to Tampa, Fla. Two cabins. Sleeps six and crew. Three toilets and lavatories. Inside white enamel and mahogany. Very complete inventory of linen, china, glassware, silver service, etc. Electric fan, life belts, safety suits, ropes, anchors, chain, etc. Entire yacht has just been refinished and refurnished inside and outside. In perfect condition and in commission for immediate use. On account of ill health owner will sacrifice for quick sale. Can be inspected by appointment. Must be seen to be appreciated. For particulars address owner. Chas. Cuno, 80 So. Vine St., Meriden, Conn.

For Sale—Two cylinder, 36 H.P., two cycle Kahlenberg engine. A-1 condition. Complete with spare parts, clutch, shaft, stuffing box, propeller. Box 91, MoToR BoatinG.

KERMATH MOTORS—WE WILL TAKE ANY MOTOR IN TRADE ON A NEW KERMATH. GET OUR SECOND HAND LIST. KERMATH MFG. COMPANY. (Detroit, Mich.)

For Sale—Motor Boat 28 feet long, hand design V-Bottom. Burger built. 30 H.P., Loew Victor 4 cylinder engine. Dual ignition. Recharging Generator, Electric head, side and tail light. Speed 18 miles. Fully equipped and practically new. Would cost over $2000 today. Owner's death compelled selling at once. Will accept first offer of $750. Address: H. M. Anschutz, Keokuk, Iowa.

Electric Plant Bargains—32 volt type with large battery, 24 light size, $195.00. 1¼ K.W. 75 lights, $585.00. 2 K.W. cylinders, $900.00. 110 volts 2 K.W., 56 cell battery, $695.00. 4 K.W., $1200.00. 6 K.W., $1950.00. 10 K.W. (without battery), $4500.00. Marine types have circulating water pumps. Quality guaranteed. Radiant plants have been built since 1916. Sold on trial—money back guarantee. Write or wire, Radiant Manufacturing Company, Sandusky, Ohio.

Auto Motor Supplies—Buick—Michigan—Stoddard Dayton—Cadillac—Overland—E.M.F. Continental and Buda Motors, all types $50 each and up. Special high tension 2 and 4 cylinder Magnetos $9.50 each. Electric and Gas Head Lamps—Coils—Carburetors — Air Compressors—Generators—Starters, etc. Write for late catalogue. Address Motor Sales Dep't. B, West End, Pittsburgh, Pa.

TRIMOUNT WHISTLE BLOWER OUTFITS
Blower runs by friction contact with engine flywheel. Whistle of brass, nickel-plated.
Made in 3 sizes.

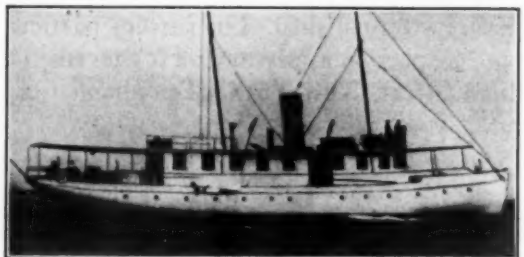
TRIMOUNT ROTARY HAND BILGE PUMPS
All bronze composition. Suction lift 6 to 20 feet. A lifelong convenience.
Made in 3 sizes.

TRIMOUNT ROTARY POWER CO.
20 Heath Street Boston, Mass.
(Factory: 292 Whiting Ave., E. Dedham, Mass.)

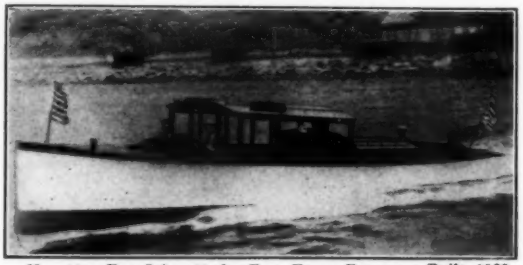
Telephone Connection
Suite 401

Marine Insurance

R. M. HADDOCK
NAVAL ARCHITECT and YACHT BROKER
50 East 42nd Street, New York

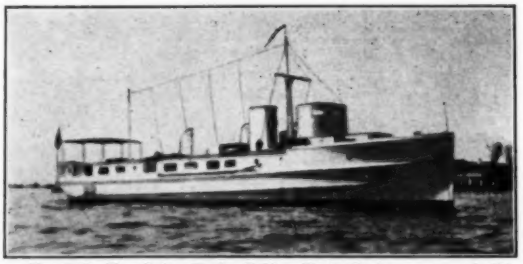


No. 113—For Sale—89 ft. x 17 ft. 6 in. x 4 ft. 10 in. Herreshoff Steamer. Accommodates ten in owner's party. Exceptionally economical to run. Has the accommodations of a houseboat with sea going qaulities of a yacht. Price very reasonable. Full particulars on request. R. M. Haddock, 50 East 42nd St., New York City.



No. 441—For Sale—40 ft. Fast Ferry Express. Built 1920. Speed 25 M.P.H. Very fully found. 150 H.P. Speedway Engine. High grade product. For particulars apply to R. M. Haddock, 50 East 42nd St., New York City.

No. 423—For Sale—50 ft. Day Cruiser, modern build in fine condition, 70 H.P. engine, completely equipped, price very attractive. Apply R. M. Haddock, 50 East 42nd St., New York City.



No. 316—For Sale—50 ft. Bridge Deck Cruiser, recent build. 70-90 H.P. Sterling engine 1917, a very snappy appearing yacht. Price asked is reasonable and offer wanted. For full particulars apply R. M. Haddock, 50 E. 42nd St., New York City.

Advertising Index will be found on page 118

NAVAL ARCHITECTS & YACHT BROKERS

JOHN G. ALDEN
YACHT BROKER AND NAVAL ARCHITECT
MARINE INSURANCE
148 State Street
BOSTON, MASS.

Thomas D. Bowes, M. E.
NAVAL ARCHITECT AND ENGINEER
Offices:
Lafayette Bldg., Chestnut and Fifth Sts.
PHILADELPHIA, PA.

COX & STEVENS
Engineers and Naval Architects
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Twenty-five years' practical experience
350 Madison Avenue New York City

Protecting Decks from Weather

(*Continued from page* 41)

The process may be shortened according to the thoroughness of the job desired, by using boiled oil for all or the latter coats. When it is undesirable to wait for the oil to dry, or by reason of using a seam composition which will not adhere to an oil surface, the linseed oil treatment after the deck is laid will be found valuable for preventing the absorption of moisture after the deck is laid. The edges of the pre-treated material may be shellacked, thus eliminating the seam composition difficulty.

Boiled linseed oil may be rubbed and polished to equal or surpass any varnish in luster durability and waterproof qualities and succeeding coats may be applied and polished any time without removing previous coats. Mahogany and kindred woods take on a beautiful color and finish, which cannot be equaled by any stain, when treated with linseed oil and exposed to sunlight.

Prevent the absorption or evaporation of moisture from the wood and you will eliminate all swelling and shrinking, producing a deck that is waterproof and one that will stay waterproof.

W. B. M., Newburgh, N. Y.

Handling the Dinghy

(*Continued from page* 42)

area where the boats can be arranged in compact orderly rows. The roller mentioned eases the work of drawing the boat up or down the runway and a boat can be easily and quickly placed by one man. The advantages of this system are that the boats are protected from chafing and damage. There is no possibility of their breaking away and being lost. They are not used by unauthorized persons and will be found when wanted. While it is true that a boat may dry out somewhat from week to week, this condition can be relieved by a bucket or two of water which will prevent it. This can be quickly spilled out when the boat is to be used again. While this method may appear cumbersome it will be found to operate well. The boats are better protected in every way and there is no question about their security. A boat afloat will in the event of a very heavy rain fill and submerge. Any floor gratings or thwarts that are not secured will float out and be lost. This will not happen where the boat is kept ashore.

C. P., Brooklyn, N. Y.

Yard & Shop

(*Continued from page* 46)

New Thorobred Motor

An announcement of unusual interest to the trade and the boating public is the Red Wing Motor Company's new Model D, 10-14 h.p. Thorobred Marine motor which is now in production and ready for delivery.

This size no doubt will find a large immediate demand and boatmen will be particularly gratified with the opportunity to procure a motor of this size embodying all of the well-known Red Wing quality and refinements.

The new Model D Thorobred is a 4-cylinder 4-cycle motor with a bore of 2¾ inches, stroke 4 inches. The crankshaft is 1¾ inches in diameter. Bearings are bronze back, babbitt lined throughout. The interior of the cylinders are ground after being machined. The unit base is of one-piece construction. The reverse gear runs in a continuous bath of oil in an oil-tight case. Joe's gear is used. The motor is equipped with a Model A Schebler Carbureter and either Atwater-Kent or Magneto ignition as suits the buyer.

This makes five sizes manufactured by the Red Wing Motor Company, Red Wing, Minn., as follows: Model D, 10-14 h.p.; Model A, 14-20 h.p.; Model AA, 18-24 h.p.; Model F, 28-36 h.p.; Model B, 32-40 h.p.

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Yacht Builder, Marine Railways, Storage and Repairs
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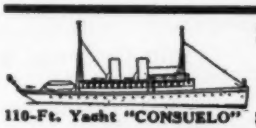
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There's big money in it for the engine agent or marine supplies dealer who handles the new model 7 JOYMOTOR. It is light, powerful, simple, well designed and well made—high grade in every respect. Sells on sight.

Quality construction makes JOYMOTOR the ideal rowboat motor. Flywheel Magneto. Reversing Propeller or Direct Steering models. Salt water fittings. Aluminum Piston. Electric Welded Gears. Easy starting, smooth running, flexible in speed control and free from vibration. Thoroughly guaranteed.

Write today for full description, prices and dealer's proposition. Don't buy any outboard motor until you know all about JOYMOTOR. Address Dept. "G"

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are carried in stock by

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Hutchinson Bros.

Columbian Bronze Propellers are carried in stock by the above distributors—order direct from them

COLUMBIAN BRONZE CORPORATION
522 Fifth Avenue New York City

The Columbian Bronze Corporation will replace without charge any Columbian Propeller that is broken in use within one year after date of installation.

Head Winds and Showers of Rain

(*Continued from page* 12)

to keep soul and body together, but with the mid-afternoon calm our spirits revive and there is a surprising amount of rifle fire at tethered targets, and diving off the bowsprit to pick up a line trailing astern and give the sharks a run for their money. Harpooning porpoises with a blunt boathook and working Marq St. Hilaire sights with a blunt cerebrum are other outdoor sports until the conventional thunderstorm of eventide comes along and we start looking for a lightship that is supposed to be somewhere along our course. Although we always steer courses from lightship to lightship it has chanced that since leaving Scotland Lightship at the entrance to New York Harbor we have never sighted one by day. Always their cheery lamps wink at us between the hours of 8 P. M. and 4 A. M.

Night follows day and day succeeds night with the allotted amount of rain and adverse wind, and eventually we reach port, where, after drying sails, bunting and bedding, we make merry with the inhabitants. It's a gay life if you happen to like it—as we all do.

But at Beaufort there is little jollity among the natives, and we employed our second day there rigging a makeshift boom for our spare jib, and renewing the hoops of the mainmast. Readers who had the temerity to glance over the fitting out installment of this yarn will remember that the possibility of having to renew the hoops by unstepping the mast caused me no little worriment. Imagine my surprise and delight to find that this was unnecessary, and that wooden hoops, when placed in the chowder kettle, become flexible and may easily be warped around the mast and their ends riveted together. I should warn other novices, however, not to cook chowder and steam hoops at the same time.

There was a severe norther blowing in Beaufort the second day of our stop there, the colors of the Marine Biological Laboratory flying straight out in the wind, and on the advice of a local prophet we delayed our departure long enough to bust into a worse northeaster. On Wednesday, May 18th, we got under way bright and early after having emptied the cylinders of a quantity of salt water that had backed up from the muffler, and at 10:30 cleared the entrance buoy, shut off the motor and set all sail for a run to Frying Pan Shoals Lightvessel, off Cape Fear.

The wind was fair (our first extended experience in sailing free) and by 7 P. M. we had logged fifty miles. In midafternoon a falling barometer and freshening breeze indicated that we would probably have a night of it, but as long as daylight lasted we kept all sail set and for a time logged 8 nautical miles an hour. At first we ran with the mainsail and mizzen wing and wing (the jib not filling on this point of sailing), but, with a following sea picking up, the mizzen showed an increasing propensity for jibing and on a S.W. ½ S. course with a N.E. wind we made it an out-and-out starboard tack and did better.

At 7 P. M., the wind strengthening, we prepared to shorten sail, and at this moment a larger wave than its fellows spilled the air from the mainsail and its running mate heaved the boom. Thus it jibed while ten feet above our heads and luckily caught in the belly of the sail on a short-lived port tack. Chambers headed her into it immediately and we doused the mainsail, the new hoops working perfectly, thereupon to find that we could not carry our new jib with its cumbersome jury boom. So we had to resort again to the storm jib.

With this bandanna handkerchief set, it was a question of sailing a course that the ship would steer, and this proved to be S.S.W., which, luckily enough, would carry us past the lighted buoy on the outer extremity of Frying Pan Shoals, some twenty-eight miles from Cape Fear. Being then prepared for heavy weather, we asked Boreas to let her flicker, and he did, giving us in twenty-four hours our best day's run of 140 miles. Meanwhile the wind continued to increase in force, and at 2:40 A. M., when my eyes were gladdened by sight of the lighted buoy abeam, we were logging 7 knots under storm jib and jigger alone. In shoal water this night would have ranked with our hair-raising experience off the Delaware Capes, but with fifteen to twenty fathoms beneath her Hippocampus rode the seas with the buoyancy of a tin duck in a bathtub. Yet it was not a night for tempting the fates, and as we could only lay a course for Charleston Lightvessel by jibing the mizzen, I let her continue on her S.S.W. course when at daylight I was relieved and took my watch below

Late in the morning watch the wind moderated and Chambers and Squibb jibed her over to the starboard tack on a course which, if continued, would have carried us to the lightship. The wind spent the morning marshalling up a flock of wicked looking nimbus clouds and employed itself during the early part of the afternoon parading them across the heavens from north to south and from south to north, and emptying them upon us with each passing. It seemed as if Capes Hatteras, Lookout and Fear were determined to punish us for passing them so easily, and the stormy petrels had a particularly sinister aspect as they picked imaginary crumbs from the water and sported with the waves.

(*Continued on page* 62)

Advertising Index will be found on page 118

SPEED AND EFFICIENCY INCREASED

"Doughboy"—Designed and built by Hacker Boat Co. 35' x 6'6", Six Cylinder, 200 H.P. Hall-Scott Marine Engine. Speed 37 miles per hour

Runabouts of both the VEE and Round Bottom Types have been improved immensely by replacing old type and heavier engines with four and six cylinder Hall-Scott Marine Motors.

DOUGHBOY formerly had a six cylinder, 5½ inch bore, 1700 lb. engine, and a speed of 32.6 M.P.H.

BRUSH BY had a four cylinder, 5½ inch bore engine, and a speed of only 32 M.P.H.

WITH SIX CYLINDER HALL-SCOTTS INSTALLED:

DOUGHBOY'S speed was increased 13½%, reliability at least 90%—gasoline consumption reduced 20%—boat made more buoyant, seaworthy and drier with lighter weight motor.

BRUSH BY'S speed was increased 31%, reliability at least 90% and vibration eliminated.

Hall-Scotts are making good in both runabouts and fast cruisers because we have an organization and factory capable of producing Better Marine Engines,—better in design, materials and workmanship.

Let us tell you what our motors will do for you

4 Cylinder, 125 H. P., Weight 1100 lbs. 6 Cylinder, 200 H. P., Weight 1300 lbs.
8 Cylinder, 300 H. P., Weight 1750 lbs.

Single and Twin Screw Plants in stock at

HALL-SCOTT MOTOR CAR CO., Inc.

Eastern Sales and Service Branch 266 Main St., Buffalo, N. Y.

FACTORY: BERKELEY, CALIFORNIA

"Brush By"—A Cinderella Type, designed by Geo. F. Crouch, and built by Reliance Motor Boat Co. Owner Jos. P. Sullivan, Thousand Island Park, N. Y. 26' x 5'3"—Six Cylinder, 200 H.P. Hall-Scott Marine Engine. Speed 42 miles per hour. Fastest single-marine-engined displacement boat in the world. Winner of her class at Thousand Islands and Buffalo races. Holder of official A.P.B.A. record of 38.1 miles per hour for 20 miles

Compass Points and Degrees and How They Compare

See also pages 28-33, 64, 78, 86, 90, 94, 98, 102, 104 and 106

New Method	Common for Both Methods	Old Method	Degrees 0-360 Method	Degrees 0-90 Method	Points	New Method	Common for Both Methods	Old Method	Degrees 0-360 Method	Degrees 0-90 Method	Points
	North						South		180- 0-0	South	0
	N¼E		2-48-45	N2-48-45E	¼		S¼W		182-48-45	S 2-48-45W	¼
	N½E		5-37-30	N5-37-30E	½		S½W		185-37-30	S 5-37-30W	½
	N¾E		8-26-15	N8-26-15E	¾		S¾W		188-26-15	S 8-26-15W	¾
	NxE		11-15-0	N11-15-0E	1		SxW		191-15-0	S11-15-00W	1
	NxE¼E		14-03-45	N14-03-45E	1¼		SxW¼W		194-03-45	S14-03-45W	1¼
	NxE½E		16-52-30	N16-52-30E	1½		SxW½W		196-52-30	S16-52-30W	1½
	NxE¾E		19-41-15	N19-41-15E	1¾		SxW¾W		199-41-15	S19-41-15W	1¾
	NNE		22-30-0	N22-30-0E	2		SSW		202-30-0	S22-30-00W	2
NNE¼E		NExN¾N	25-18-45	N25-18-45E	2¼	SSW¼W		SWxS¾S	205-18-45	S25-18-45W	2¼
NNE½E		NExN½N	28-07-30	N28-07-30E	2½	SSW½W		SWxS½S	208- 7-30	S28-07-30W	2½
NNE¾E		NExN¼N	30-56-15	N30-56-15E	2¾	SSW¾W		SWxS¼S	210-56-15	S30-56-15W	2¾
	NExN		33-45-0	N33-45-0E	3		SWxS		213-45-0	S33-45-00W	3
	NE¾N		36-33-45	N36-33-45E	3¼		SW¾S		216-33-45	S36-33-45W	3¼
	NE½N		39-22-30	N39-22-30E	3½		SW½S		219-22-30	S39-22-30W	3½
	NE¼N		42-11-15	N42-11-15E	3¾		SW¼S		222-11-15	S42-11-15W	3¾
	NE		45- 0-0	N45- 0-0E	4		SW		225- 0-0	S45-00-00W	4
	NE¼E		47-48-45	N47-48-45E	4¼		SW¼W		227-48-45	S47-48-45W	4¼
	NE½E		50-37-30	N50-37-30E	4½		SW½W		230-37-30	S50-37-30W	4½
	NE¾E		53-26-15	N53-26-15E	4¾		SW¾W		233-26-15	S53-26-15W	4¾
	NExE		56-15-0	N56-15-0E	5		SWxW		236-15-0	S56-15-00W	5
	NExE¼E		59-03-45	N59-03-45E	5¼		SWxW¼W		239-03-45	S59-03-45W	5¼
	NExE½E		61-52-30	N61-52-30E	5½		SWxW½W		241-52-30	S61-52-30W	5½
	NExE¾E		64-41-15	N64-41-15E	5¾		SWxW¾W		244-41-15	S64-41-15W	5¾
	ENE		67-30-0	N67-30-0E	6		WSW		247-30-0	S67-30-00W	6
ENE¼E		ExN¾N	70-18-45	N70-18-45E	6¼	WSW¼W		WxS¾S	250-18-45	S70-18-45W	6¼
ENE½E		ExN½N	73-07-30	N73-07-30E	6½	WSW½W		WxS½S	253-07-30	S73-07-30W	6½
ENE¾E		ExN¼N	75-56-15	N75-56-15E	6¾	WSW¾W		WxS¼S	255-56-15	S75-56-15W	6¾
	ExN		78-45-0	N78-45-0E	7		WxS		258-45-0	S78-45-00W	7
	E¾N		81-33-45	N81-33-45E	7¼		W¾S		261-33-45	S81-33-45W	7¼
	E½N		84-22-30	N84-22-30E	7½		W½S		264-22-30	S84-22-30W	7½
	E¼N		87-11-15	N87-11-15E	7¾		W¼S		267-11-15	S87-11-15W	7¾
	East		90- 0-0	East	8		West		270- 0-0	West	8
	E¼S		92-48-45	S87-11-15E	7¼		W¼N		272-48-45	N87-11-15W	7¼
	E½S		95-37-30	S84-22-30E	7½		W½N		275-37-30	N84-22-30W	7½
	E¾S		98-26-15	S81-33-45E	7¾		W¾N		278-26-15	N81-33-45W	7¾
	ExS		101-15-0	S78-45-00E	7		WxN		281-15-0	N78-45-00W	7
ESE¾E		ExS¼S	104-03-45	S75-56-15E	6¾	WNW¾W		WxN¼N	284-03-45	N75-56-15W	6¾
ESE½E		ExS½S	106-52-30	S73-07-30E	6½	WNW½W		WxN½N	286-52-30	N73-07-30W	6½
ESE¼E		ExS¾S	109-41-15	S70-18-45E	6¼	WNW¼W		WxN¾N	289-41-15	N70-18-45W	6¼
	ESE		112-30-0	S67-30-00E	6		WNW		292-30-0	N67-30-00W	6
	SExE¾E		115-18-45	S64-41-15E	5¾		NWxW¾W		295-18-45	N64-41-15W	5¾
	SExE½E		118-07-30	S61-52-30E	5½		NWxW½W		298-07-30	N61-52-30W	5½
	SExE¼E		120-56-15	S59-03-45E	5¼		NWxW¼W		300-56-15	N59-03-45W	5¼
	SExE		123-45-0	S56-15-00E	5		NWxW		303-45-0	N56-15-00W	5
	SE¾E		126-33-45	S53-26-15E	4¾		NW¾W		306-33-45	N53-26-15W	4¾
	SE½E		129-22-30	S50-37-30E	4½		NW½W		309-22-30	N50-37-30W	4½
	SE¼E		132-11-15	S47-48-45E	4¼		NW¼W		312-11-15	N47-48-45W	4¼
	SE		135- 0-0	S45-00-00	4		NW		315- 0-0	N45-00-00W	4
	SE¼S		137-48-45	S42-11-15E	3¾		NW¼N		317-48-45	N42-11-15W	3¾
	SE½S		140-37-30	S39-22-30E	3½		NW½N		320-37-30	N39-22-30W	3½
	SE¾S		143-26-15	S36-33-45E	3¼		NW¾N		323-26-15	N36-33-45W	3¼
	SExS		146-15-0	S33-45-0E	3		NWxN		326-15-0	N33-45-00W	3
SSE¾E		SExS¼S	149- 3-45	S30-56-15E	2¾	NNW¾W		NWxN¼N	329-03-45	N30-56-15W	2¾
SSE½E		SExS½S	151-52-30	S28-07-30E	2½	NNW½W		NWxN½N	331-52-30	N28-07-30W	2½
SSE¼E		SExS¾S	154-14-15	S25-18-45E	2¼	NNW¼W		NWxN¾N	334-41-15	N25-18-45W	2¼
	SSE		157-30-0	S22-30-00E	2		NNW		337-30-0	N22-30-00W	2
	SxE¾E		160-18-45	S19-41-15E	1¾		NxW¾W		340-18-45	N19-41-15W	1¾
	SxE½E		163-07-30	S16-52-30E	1½		NxW½W		343-07-30	N16-52-30W	1½
	SxE¼E		165-56-15	S14-03-45E	1¼		NxW¼W		345-56-15	N14-03-45W	1¼
	SxE		168-45-0	S11-15-00E	1		NxW		348-45-0	N11-15-00W	1
	S¾E		171-33-45	S 8-26-15E	¾		N¾W		351-33-45	N 8-26-15W	¾
	S½E		174-22-30	S 5-37-30E	½		N½W		354-22-30	N 5-37-30W	½
	S¼E		177-11-15	S 2-48-45E	¼		N¼W		357-11-15	N 2-48-45W	¼

Fig. 148—Table showing the names of all points and quarter points of the compass by all methods as well as two methods of using degrees.

Darkness and something wrong—

then **Magnet-Lite** proves a real friend to the motor boatman. Its powerful electro-magnet base sticks like a barnacle to any metal part of your craft. No amount of sea or vibration of the motor can break its hold. The little lamp *stays* where you put it! When the magnet-grip is not required, the magnet may be switched off without shutting off the light.

Magnet-Lite may be used in the most inaccessible corners, yet it gives plenty of light. Bulb is protected by a strong wire guard.

Operated from storage batteries with a plug connection, **Magnet-Lite** is furnished with 144 inches of cord. It will be found most convenient in finding articles or, in emergency, as a binnacle or riding light.

Magnet-Lite is sent anywhere, charges prepaid, on receipt of this coupon and $5.00, or it may be had at your dealers.

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☐ Check ☐ Currency
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Gentlemen: Enclosed find $5.00. Ship at once, one **Magnet-Lite** complete, charges prepaid.

Please indicate:
☐ Single Contact
☐ Double Contact
☐ 6-8 v. storage battery
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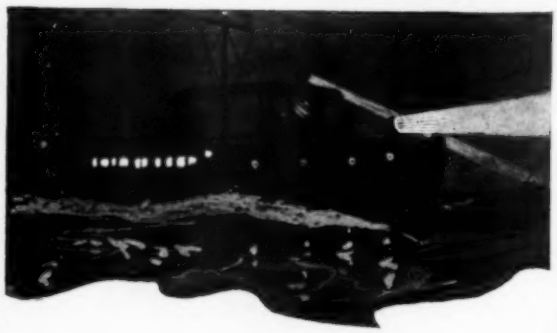


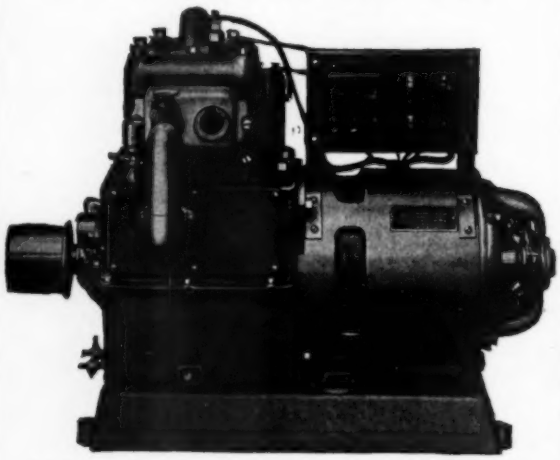
Columbian
C. Y. C.
Electric Generating Plants

THE compactness of the Columbian C-Y-C Electric Generating Plant lends this system admirably to motor boat and yacht lighting.

The fact that the engine operates on kerosene speaks for economy; motor and engine are direct connected, engine parts are interchangeable with Ford engine parts and the generator of 1½ kw. capacity is as highly developed as modern electrical science can make it.

The Columbian C-Y-C System offers the marine dealer exceptional opportunities not only in the marine field but the lighting and power field as well. Exclusive territory rights if you apply immediately.

Columbian Bronze Corporation
522 Fifth Avenue, New York City



32 Volt, 1½ Kw. Length, 33 in.; Width, 22 in.; Height, 23 in.; Overall Dimensions. Net Weight, 425 lbs. Weight of Batteries, 375 lbs.

Head Winds and Showers of Rain

(*Continued from page* 58)

Yet at 3 P. M., in the middle of the most breath-taking downpour of the day, the wind died completely and for two hours while the sun battled with the clouds for supremacy we slatted in a dead calm, the mizzen boom playing its anvil chorus until our nerves cried for peace and quiet. Then a slant of wind of equal strength hit us from the southeast and for two hours more bowled us along our westerly way. The Gulf Stream had set us during the day and at midnight we were not greatly surprised when on a dying breeze we sighted Cape Romain at some distance on our starboard bow.

Again the wind breathed out and for the following twelve hours we made nothing but leeway and showed a hypothetical gain on the patent log of 5½ miles. It then became time to start the motor to reach Charleston before dark—and I made my first heinous navigational error. I mention it as a warning to others, because, although no one else has ever done it, it might easily be repeated by the careless. I applied a point of deviation the wrong way.

Consequently, when we had overrun our distance from Cape Romain to Charleston Lightvessel, there was no vessel and no land in sight and we bore up to westward looking for landmarks. Presently the keen eyes of the exec sighted Charleston Lighthouse, a match stick standing upright on the horizon, and we laid a northwesterly course for it, having erred in our landfall by a matter of ten miles. Naturally enough, I was deeply chagrined and promised the crew to set up the first round when we come to the countries where the setting is good. Thus mutiny was prevented and we squared away for the jetties with easy consciences.

Upon Charleston we turn our backward glances with particularly tender memories. Arriving at the Carolina Yacht Club in the moonlight we were assigned a berth alongside the dock, and by no less than a dozen members were cordially extended the hospitality of the club, which included hot showers, shore food and all kinds of elbow room for writing letters. At Charleston, too, we learned that the Haig twins still fly their five-starred flag in the face of the enemy—and we took them into camp and were glad.

The first day in port was devoted to drying everything which had become wet—which was everything aboard ship. And on the following day we painted the deck house and varnished the hatches. But that afternoon we accepted the hospitality of Mr. Charles C. West, a member of the club, and with his two friends, Middleton and Dexter, took the road to Folly Beach with alarming alacrity. On the hard sand of the beach, avoiding the waves of an oncoming tide, we watched the laggard hand of the speedometer work up to 45 and knew that it undertold the truth by twenty miles. Then we swam, returned to the club for food, and called it a banner day.

The next was somewhat like it, being a judicious mixture of work and play, and including acceptance of the kind invitation of Squibb's friend Lieut. Berwick Lanier to lunch with him aboard his destroyer Biddle. There, on a tour of inspection Chambers was amazed to see on the fantail the identical Y gun which had equipped his S. C. 63 during the war. With great restraint no one remarked on the smallness of the world. In the evening we made poor shift to return the hospitality of Mr. West, and on the evening following Lieutenant Lanier paid us the honor of sharing our vesperal corn fritters. Over the cigarettes there was much anecdote of the Navy in general and of the esteemed Captain "Juggy" Nelson in particular. He it was who won the war for the Allies with the Adriatic Detachment of sub-chasers, and we regretted keenly the orders which had despatched him and the U.S.S. Leonidas (with all speed possible) to New York ten days before our arrival in Charleston.

The next day, May 25th, having finished our ship's work, we lashed everything down and headed to sea, laden with much booty from the post and express offices. It remains only at this juncture to list the booty and credit the generosity of the donors. First, a Corbin tachometer, which, when installed on the shaft with its dial illuminating the cockpit, will make Hippocampus blush for the speed she lacks; second, a gallon of Kirby's copper bottom paint which in a month or so will make the ravenous teredo grind his jaws in impotent fury; and third, a Grether portable searchlight, which, installed on a hinged bracket in the cockpit, enlighens the world and shows us in particular the way our telltale tends on dark and stormy nights.

We have not yet caught up with the 8-foot dink which the Skaneateles people have expressed to Jacksonville with their compliments, intending thereby to assuage our grief at losing our wherry in the storm of May 3rd. When we do we shall shun line-breaking paint-marring docks, and anchor at will. Then our happiness will be complete.

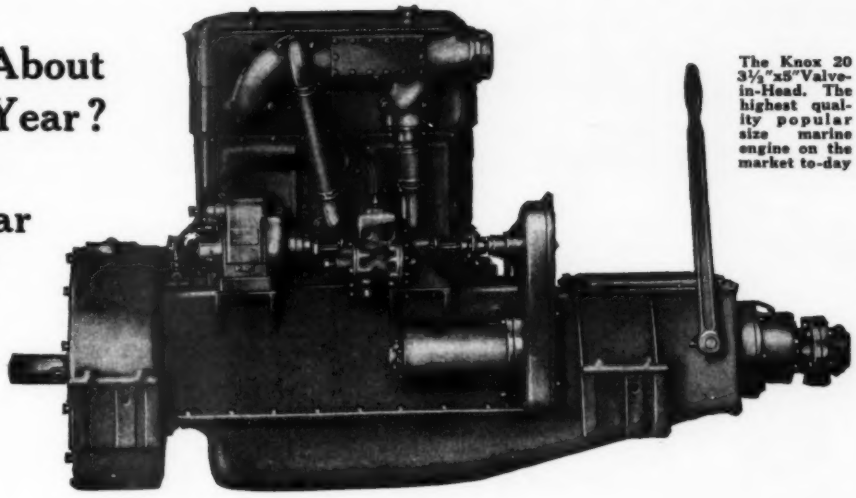
(*Editor's Note:* In the next installment Mr. Loomis will tell of the crew's reacquaintance with their old friend Tom Collins, of their run down the coast to Miami, of an unlooked for spell of good weather, and of last preparations for departure to West Indian waters.

Advertising Index will be found on page 118

Knox
VALVE-IN-HEAD

"Steady Service"

How About Next Year? —and the year after?

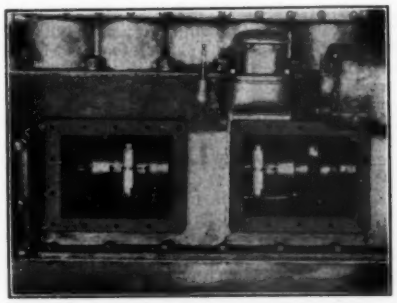


The Knox 20 3½"x5" Valve-in-Head. The highest quality popular size marine engine on the market to-day

UNDER the Knox policy it isn't enough to sell you an engine that will run faultlessly when it comes from the factory, brand new and in perfect adjustment. We want you to get the same faultless service next year, the year after, and for ten or twenty years if you care to use it that long.

So we have built permanent service into the Knox Twenty, in the form of high grade materials, excellent workmanship and the most highly developed design ever seen in a marine motor of this size.

For example, the lubricating system is remarkably complete, forcing oil under pressure to every moving surface throughout the engine and reverse gear—to the bearings through drilled crankshaft, to the valve rockers through hollow rocker arm shaft, to reverse gear and thrust bearing. Actual wear is reduced to practically nothing by this efficient lubrication.



These large handhole plates on the Knox Twenty permit adjusting the crankshaft bearings quickly, easily and accurately. There's room to get both hands and a wrench inside the crankcase so it's easy to do a good job and do it quickly

By providing unusual accessibility we have simplified care and maintenance. By employing the latest improvements in automotive design we have produced an engine that runs smoother and lasts longer than any engine of its class you ever saw.

Let us send you the full description. Write to-day.

KNOX MOTORS ASSOCIATES

Springfield, Mass., U. S. A.

Made in New England at Springfield, Mass., by Knox Motors Company, also manufacturers of Truck, Tractor, Passenger Car Engines and industrial power sets.

Motor Boating

Designed and made by J. E. Caldwell & Co., Philadelphia

Trophies In Precious Metals

Upon short notice, J. E. Caldwell & Co. are prepared to furnish original designs for special trophies, with estimated cost of production.

They carry in stock, for immediate delivery, a collection of loving cups, bowls, vases and other pieces suitable for presentation as prizes.

Information and Illustrations Upon Request

J. E. Caldwell & Co.

Philadelphia

The Compass as a Common, Convenient and Correct Companion

(*Continued from page* 33)

Therefore, determine to conquer the subject of the compass and you will never regret it.

As an introductory remark we should like to advise everyone to believe in his compass. Many more disasters have occurred on account of one's disbelief in his compass than to the contrary. It is true that the compass has errors but these errors are easily determined and after they have been determined make the compass as accurate as a watch. Therefore, believe what your compass tells you and it will always guide you to safety.

The compass is an instrument so devised that it always points, with very few exceptions to be explained later, to one spot on the earth's surface known as the magnetic pole. There are two of these magnetic poles, the one in the northern regions being called the North Magnetic Pole and that one in the Southern Hemisphere is known as the South Magnetic Pole. The locations of these two magnetic poles are definitely known, the Northern Magnetic Pole being located somewhat north of Hudson Bay.

The magnetic poles are not the same as the geographic poles which are the extremities of the axis on which the earth is supposed to rotate. Neither is the location of the magnetic and geographic poles coincident.

What the Compass Is

The compass is nothing more than a magnet suspended so as to be allowed to swing freely in a horizontal plane. In theory, an ordinary knitting needle magnetized by drawing a toy magnet along its length a few times, and suspended from the center by means of a thread so that it can swing in a horizontal plane, is as much of a compass as the ones we use on our boats to-day. If such a needle is magnetized and suspended it will immediately assume a north and south position.

But the compass, as we know it, consists of a number of magnetized needles bound together, and suspended or pivoted from beneath. On this bundle of magnetized needles we have a card mounted to give us a better sense of direction, and allow us to determine directions other than north and south, which would be the only two indicated by the magnetized needles if we had no card mounted thereon.

There has been little or no change in the mariner's compass for centuries. In theory and construction it is practically the same as it was more than one hundred years ago. The only changes which have been made are refinement in its construction, and the markings on the compass card.

The Dry Compass

The older compasses were known as dry compasses; that is, simply magnetic needles and a card pivoted at the center. Naturally such an arrangement was very sensitive and responded to the motion of the ship very freely. With the coming of the steam engine, and later, the internal combustion motor, it was found that the vibrations set up by the machinery were such as to keep the compass card in constant motion, which naturally made it unreliable as a navigating instrument. The development of the liquid compass followed, and this type overcomes to a large extent the difficulty and trouble experienced with the dry compass.

The Liquid Compass

The liquid, or wet compass, is practically no different from the dry compass, with the exception that a liquid generally consisting of a mixture of 55 per cent. water, and 45 per cent. alcohol is introduced into the bowl of the compass, and then the latter is sealed up. The liquid not only prevents the compass needle and card from responding to small vibrations due to power plants and the sea, but also tends to buoy up or float the needle and card, and thus make it rest more lightly on its pivot. This allows the card to turn more freely as the ship is turned, or rather to hold its position more steadily as the ship's bow is turned away from the compass. The smaller and less expensive compasses use kerosene as the filling liquid, and some of the newer makes use oil instead of alcohol and water. On account of the nature of the various kinds of fluids used, the compass as we know it is practically non-freezable in ordinary latitudes.

The Lubberline

Compasses are fitted with a gimbal ring to keep the bowl and card level under every circumstance of a ship's motion in a seaway, the ring being connected with a binnacle or compass box by means of journals or knife edges. On the inside of every compass bowl is drawn a vertical black line called

(*Continued on page* 78)

Advertising Index will be found on page 118

Smiles That Never Fade In Caille Powered Boats

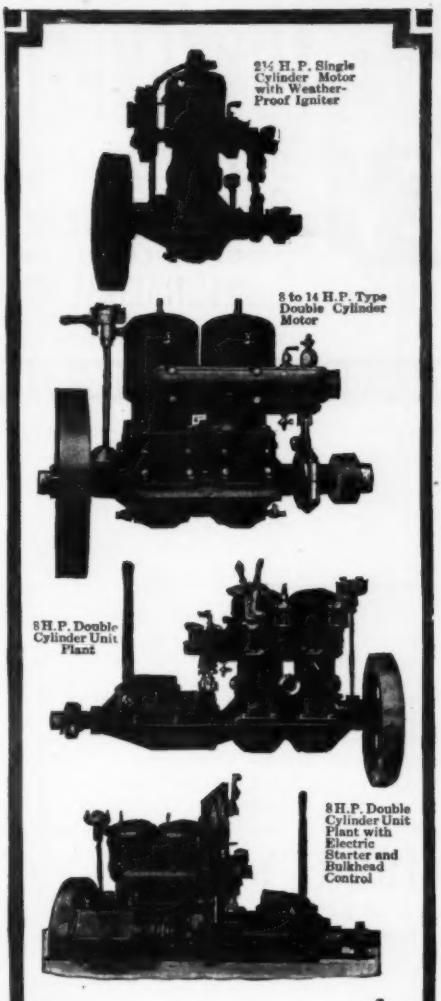
NEXT to a rainy day there's nothing that can take the joy out of an outing on river or lake so completely as a misbehaving motor. There's swearing and sweating, stewing and fuming, and not a soul in the boat dares say a word except the grease-covered owner. And he says a-plenty.

But in Caille powered boats it's different. All the swearing and stewing was done years ago while Caille Perfection Motors were being perfected. Now smiles never fade in Caille powered boats. The owner is proud as a peacock of his motor, for he knows he can always depend on it. His friends can never kid him about "that pile of junk he calls a motor." His Caille motor is always ready and eager to go, sending the boat a-skimming o'er the waves. It's the easiest motor to get along with you ever saw.

Caille Perfection Two-Cycle Motors are made in a wide range of sizes, from 2½ to 20 H. P. They are built in standard and heavy duty types and are furnished with salt or fresh water fittings. They operate on gasoline or kerosene and can be supplied with magneto or battery ignition.

Our 14 H. P. Caille Aristocrat Motor is the finest motor of its size in the world—bar none. It is of 4-cycle design and is equipped with Northeast electric starter, Willard storage batteries, Bosch magneto, Schebler carburetor and Caille positive action reverse gear.

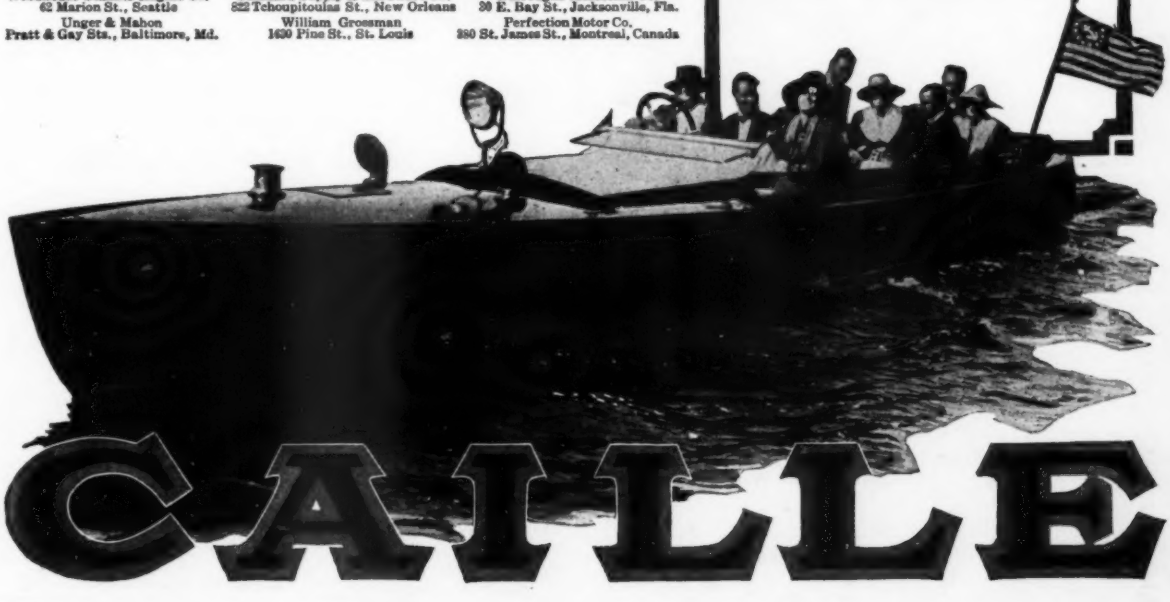
We also build rowboat motors of various types and prices. All Caille motors are quality motors. Write for complete details. State type of motor in which you are interested.


2½ H. P. Single Cylinder Motor with Weather-Proof Igniter
8 to 14 H.P. Type Double Cylinder Motor
8 H.P. Double Cylinder Unit Plant
8 H.P. Double Cylinder Unit Plant with Electric Starter and Bulkhead Control

The Caille Perfection Motor Company

47 Caille Building **Detroit, Michigan**

G. H. Masten Co. 33 E. Ninth St., N. Y.	T. T. Burchfield Co. 604 Arch St., Philadelphia	Toledo Sales & Engine Co. 6 St. Clair St., Toledo	Gray Aldrich Co. 84 Atlantic Ave., Boston
Woodhouse-Schmits Engine Co. 62 Marion St., Seattle	Standard Supply & Hardware Co. 822 Tchoupitoulas St., New Orleans	Burroughs-McMeekin Co. 30 E. Bay St., Jacksonville, Fla.	
Unger & Mahon Pratt & Gay Sts., Baltimore, Md.	William Grossman 1630 Pine St., St. Louis	Perfection Motor Co. 380 St. James St., Montreal, Canada	



CAILLE

Two Cycle Motors

LUNKENHEIMER
Automotive Accessories

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THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI

RELIABILITY-ECONOMY-SERVICE

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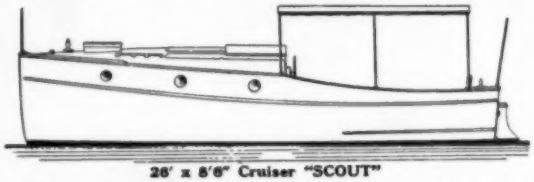
MULLINS STEEL BOATS CAN'T SINK

Big, new Catalog, describing many styles of the latest type of "V" Bottom steel motor boats, rowboats or canoes mailed upon request. *Write for it today.*

THE MULLINS BODY CORP.
Boat Department
622 Depot Street Salem, Ohio



26' x 8'6" Cruiser "SCOUT"

The most for the money on the market today. Large cockpit, roomy cabin with toilet, galley and berths for four. Full headroom. Four cycle motor, speed 9-10 miles, fully equipped for cruising, $2500.00.

We have a large number of models in both Runabout and Cruisers from which we furnish K D frames to complete outfits. We gladly quote on your requirements.

RICHARDSON BOAT CO.
370 Sweeney St., No. Tonawanda, N. Y.

HESS MONO-MARINE

A High Grade Single Cylinder Four Cycle Engine of 4-5 H.P.

The ideal engine for your tender, fishing boat or other craft up to 30 ft., and on larger boats for operating generators for lighting plant or wireless outfit.

Many parts interchangeable with standard Ford engine parts, carried in stock by dealers the world over. This includes timing gears, valves, valve springs, connecting rod, piston, etc. Dual ignition.

Furnished complete with Hot-Spot Manifold, High Tension Magneto, Carburetor, Timer, Spark Coil and Switch.

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"LIBERTY KID"

The Best Little Medium-Duty Marine Engine on the Market

High grade four cycle design, valve-in-head, removable cylinder head, bronze rocker arms, push-rods, plunger pump, etc. Over 200 in actual use.

Immediate deliveries on early orders. Write for catalog and testimonials.

AGENTS AND DEALERS WANTED

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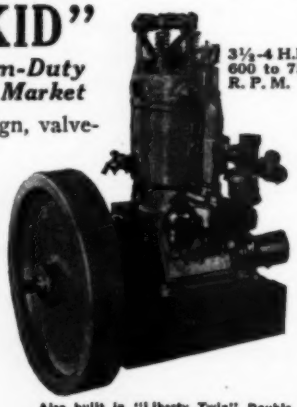
Manufacturer and Sole Distributor
440 Market St., San Francisco, Cal.



3½-4 H.P. 600 to 750 R. P. M.

Also built in "Liberty Twin" Double Cylinder Model giving 8-10 H.P., for gasoline or kerosene

The Barker Motor

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"Have run my Barker Motor thirty thousand miles in ten years and it is good for ten years more."—Name on request.

Built for long service
Sells at low price

The BARKER FACTORY
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Write for Barker's "Red Letter" Book of Motors

In New York:
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TOPPAN CO.
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In Philadelphia:
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Gearless Drive Outboard Motors
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The Motor of No Drawbacks

Solves:
The Starting Problem
The Weed Problem
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GEARLESS DRIVE

In carrying or in stalling position heaviest part weighs 40 lbs. All parts accessible. Carries like a hand bag. Detachable propeller shaft. Removable gas tank. Convertible to inboard. Write for particulars.

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You Can Build Your Own Boat

and save 2/3 the cost
By the BROOKS K. D. SYSTEM

Brooks Boats are handsome, seaworthy, up-to-date in design and easy to build. We also build complete boats.

The Brooks Guarantee:
Your Money Back if You Are Not Satisfied
Send 10c for 64-page catalogue showing all models.

BROOKS MFG. CO., 1101 Rust Ave., Saginaw, Mich.

Advertising Index will be found on page 118

MARINE ELECTRICAL EQUIPMENTS

SHIPS TELEGRAPHS

SINCE 1845 WE HAVE BEEN DESIGNERS AND MANUFACTURERS OF COMMUNICATING AND SIGNALLING SYSTEMS FOR NAVAL AND MERCHANT VESSELS.

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SAN FRANCISCO
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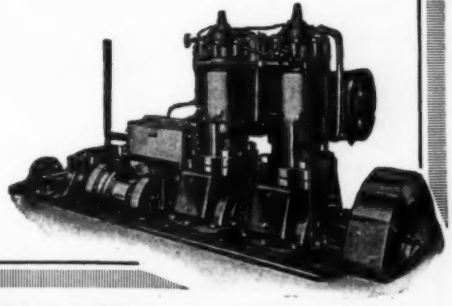
THE MIANUS

AN IMPROVED DIESEL

NOT a "Semi-Diesel"; NOT a surface ignition engine; NOT an engine requiring pre-heating of any kind.
BUT a real Diesel of 500 lbs. compression in which the usual complicated Diesel engine mechanism has been eliminated.
It retains all the wonderful efficiency, smoothness of power flow, great range of control, and complete freedom from carbon of the Diesel Type.
In sizes as low as 7½ H. P.

Write today for Catalog "R" giving full details

We are also builders of MIANUS Gasoline Motors.



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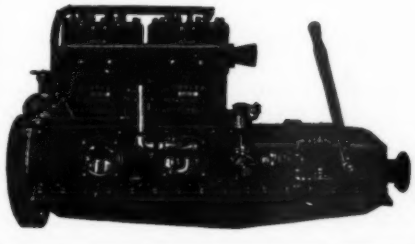
GRAY-PRIOR

FOUR CYCLE MARINE MOTORS

Built up to a Standard—not down to a price



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For Commercial Boats and Cruisers

Model D-4, Medium Heavy Duty

36 Horse Power Bore, 4½ inches Stroke, 6 inches

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56 Suffield Street Hartford, Conn., U. S. A.

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"V" Bottom Hydroplanes

CABIN CRUISERS

of all types made from our plans or to your design. Let us tender on your new boat.

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WALTER DEAN CANOE & BOAT CO., Ltd.

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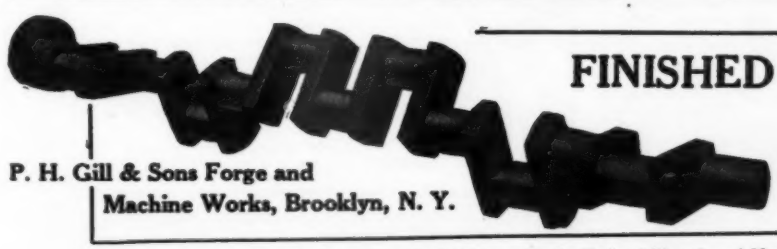

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A satisfactory stove. Burns denatured alcohol. For boat or camp use. Black enamel finish. Will give satisfaction. Width 20 in. Depth 15 in. Height to top of tank 9 in. **Price $17.50.**

This 6-volt Marine Horn combines distinctive marine appearance with a coarse heavy tone. The horn is of the vibrator type, with a very small current consumption; non-arching, full nickel finish projector for salt water use. 9 in. high, 4 in. wide at base, weighs 2¾ lbs. **Price $9.50.**

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meet all U. S. Government specifications and receive the highest classifications of American Bureau of Shipping and Lloyds Register of Shipping.

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The Last Word in Yacht Designing and Building

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Model A4 Special 4-5 H.P.

Waterman Motors—
Known The World Over
This High Grade Power Unit is Offered at
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With Fresh or Salt Water Fittings
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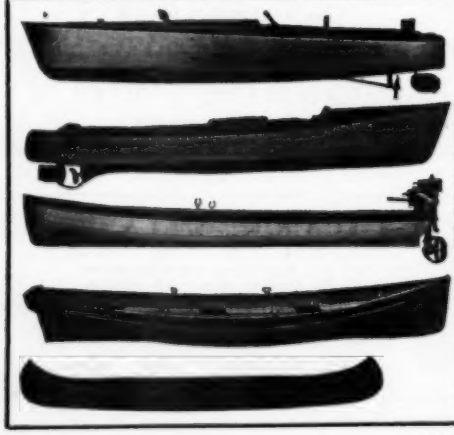

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Special Boats for Outboard Motors, Motor Boats 16 to 24 ft. long. For lakes, rivers, shallow water and weeds.

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Write us today

Anything for boat or ship, large or small. Honest Goods at Honest Prices.

BOSTON MARINE HARDWARE CO
259 Atlantic Ave., Boston, Mass.

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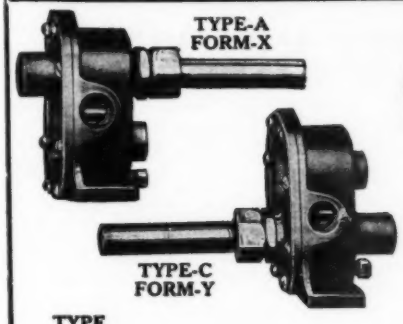
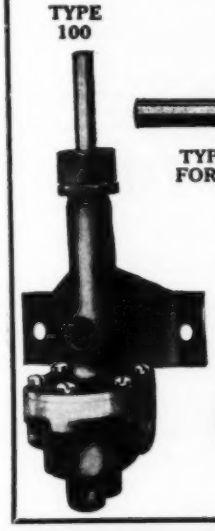
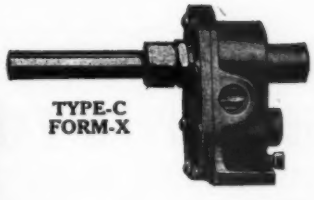
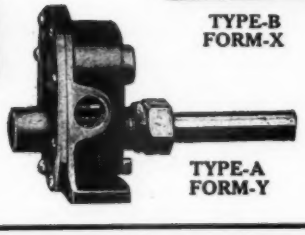
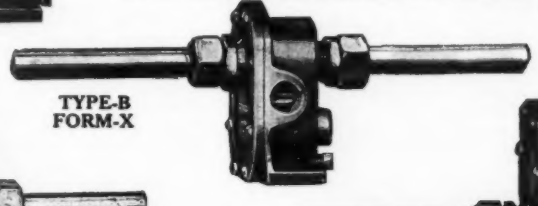


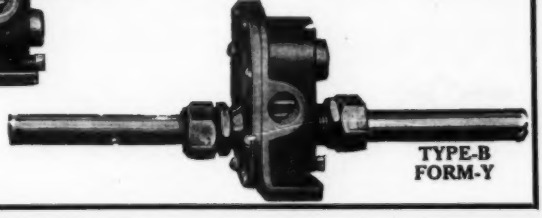
Oberdorfer Pumps











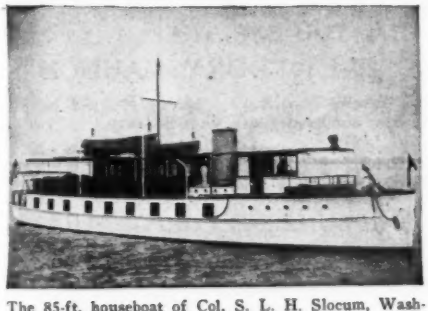
The finest power plant made will not operate properly if it is equipped with an inferior pump, whether it supplies water, fuel or oil.

OBERDORFER BRONZE GEARED PUMPS

are built especially for marine use—they are made to withstand the hard service encountered in use on board boat—*Oberdorfer Bronze Geared Pumps* are noiseless, automatic, compact and reliable. The supply of water, fuel or oil is governed entirely by the motor—*there is never an over or under supply.* If you have ever had trouble with your pump you will find a world of satisfaction in the trouble-proof Oberdorfer.

If you own a boat powered with an internal combustion engine you will be interested in our new book on pumps. Your copy is ready for you—it comes *free* on your request.

M. L. OBERDORFER BRASS CO., 812 E. Water St., Syracuse, N. Y.



The 85-ft. houseboat of Col. S. L. H. Slocum, Washington, D. C.—the Mathis-built Luneta.

Plan Early

It may seem premature to discuss next Winter's plans, but there is just about enough time remaining to make *adequate* houseboat preparation.

To postpone decision at this time is to risk disappointment. Later, when the yards are pressed and the big demand has made it difficult to secure even a short-term charter, the Florida devotee who is *all ready* with his houseboat at the season's opening is the one who is *already* making his plans—now.

It is none too early to have us give you an estimate on a

Mathis-Built Houseboat

for delivery in time for you to enjoy its ideal seaworthiness, spacious comfort and its ability-to-go-anywhere every minute of your next Winter's stay in Florida.

Your boat will have plenty of Mathis-built company wherever finest houseboats congregate.

MATHIS YACHT BUILDING COMPANY

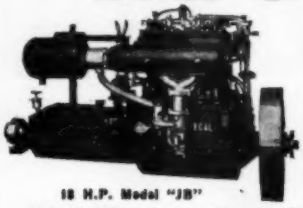
Specialists in Houseboats and Cruisers from 40 to 120 feet

COOPER'S POINT **CAMDEN, N. J.**

Twenty Years on the Market

REGAL

—FOUR CYCLE—
MARINE ENGINES



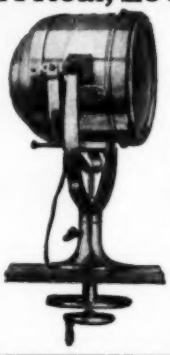
18 H.P. Model "JB"

Built for commercial or pleasure boats. Sizes 2 H.P. —weight 125 lbs. to 50 H.P. —weight 5000 lbs. One to four cylinders. Use gasoline, kerosene or distillate for fuel. Easy to start and may be throttled to a very slow speed.

REGALITE—the new Electric Lighting Plant, 2 h.p. air cooled motor, ¾ k.w. generator. Write for information.

REGAL GASOLINE ENGINE CO.
74 West Pearl Street COLDWATER, MICH.

A Real, Low-Voltage Searchlight!



BY far the most powerful searchlight of the incandescent type.

Unlike anything you have ever seen.

Built entirely of brass with our own specially designed heavy glass reflector and bulb.

Furnished in three sizes: 7, 10, and 14 inch for 6, 12, 24, 32, or 110 volts.

Finished in Polished Brass, Black, Nickel, and Battleship Gray.

Projects an intense beam of 116,000 to 530,000 Candle Power a distance of One Half to One Mile, depending on size of searchlight and voltage.

Send for Catalog

SOUTHLAND STEAMSHIP COMPANY
Lebby Products Department
Savannah, Georgia

Build It of Cypress

"the Wood Eternal"

and forget about planking rotting and the need of constant repairs. For 20-ft. Runabout or 200-ft. Cruiser—or more—or less—no wood compared with grand, old CYPRESS "the wood Eternal." Write TODAY for Vol. 19 of the famous CYPRESS POCKET LIBRARY, "CYPRESS FOR BOATS." It tells *Why*. It's FREE.

TIDEWATER CYPRESS, "the Wood Eternal," is identified by the CYPRESS trade-mark "arrow." Please write us immediately if you can't find it.

Southern Cypress Manufacturers' Assn.
1317 Perdido Building, New Orleans, La., or
1317 Heard National Bank Bldg., Jacksonville, Fla.

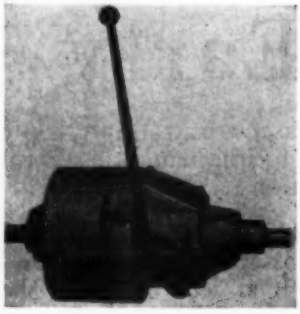
WOOLSEY COPPER PAINTS

and MARINE PAINT SPECIALTIES
ARE THE WORLD'S STANDARDS

Copper Paints—Brown, Red and Green, Yacht White, Deck Paint, Marine Mixed Paints, Metal Bottom Paint, Seam Paint, Seam Compounds, Sparon (Spar) Varnish, Engine Enamels, Canoe Enamels, Boat Bottom Seam Compound, Copper Bronze, Light Sea Green and Regatta Green Yacht Bottom Paints, etc.

C. A. WOOLSEY PAINT & COLOR CO.
Jersey City, N. J., U. S. A.

Send for our Marine Booklets, Free—Contain Color Spots and information "How to Paint a Boat."



MASTER REVERSE GEARS

Strictly high quality reverse gears. Multiple disc clutch, nickel steel shaft and gears, hardened and ground, with bronze bushings working on hardened steel pins. Aluminum case saves weight.

Four sizes transmitting 12, 25, 50 and 85 H.P. respectively per 1000 R.P.M.

Write today for prices.

MASTER MOTOR CO.
19 Price Ave.
Lockport, N. Y.

DON'T BUY A BOAT

TILL YOU SEE THE

CAPE COD 20-FT. DORY LAUNCH

The Safest Little Family Boat Built. Motor Housed In.
Other Standardized Cape Cod Boats

17′ Sail Dory	14′ Outboard Motor
16′ Shallow Draft	10′ Row Boat
17′ Life Saving Dory	12′ Row Boat

Write for Prices.

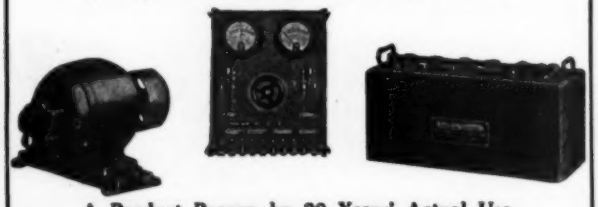
CAPE COD SHIPBUILDING CORPORATION

Successors to Cape Cod Power Dory Co.
Builders of craft to 150′ length, or 10′ draft.

Winter Storage.

Main Office and Works, 367 Main Street, Wareham, Mass.
New York Show Rooms, 412 Eighth Avenue, New York City
Export Office, Factory Sales, 120 Broadway, New York City

"DAYTON" LIGHTING AND IGNITION SYSTEMS. 6, 12, 32 VOLTS COMPLETE



A Product Proven by 20 Years' Actual Use.
Complete Catalogue Upon Request.
THE A-C ELEC. MFG. CO., DAYTON, OHIO

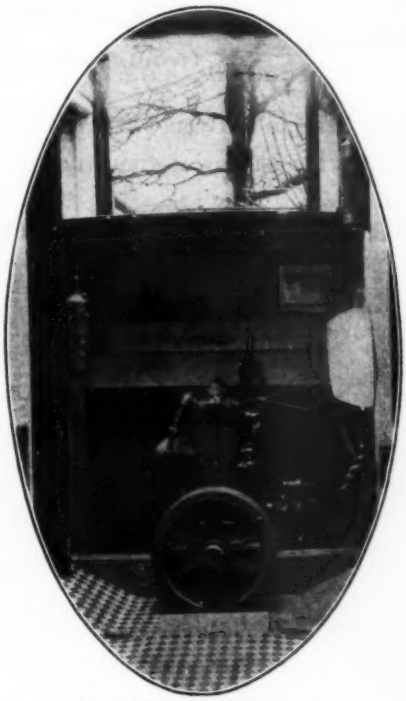
Crockett's Spar Composition
is the only varnish
which will last
a season on
a deck

E. Z. VARNISH REMOVER
Film remains soft until removed

THE DAVID B. CROCKETT COMPANY
Bridgeport, Conn.
The Bissell Varnish Company, *Successor*

Advertising Index will be found on page 118

A PALMER IS THE MOTOR



Power Plant of the Hippocampus

which is helping the Hippocampus on her 7000 mile trip

Over 1,000 miles already covered.

Follow the Palmer on her trip to San Francisco.

There is a Palmer for every purpose. From 2 1-2 h. p. model A-1, 2 cycle up to a six cylinder 75-85 h. p. 4 cycle.

PALMER BROTHERS ENGINES, Inc.

COS COB, CONN.

Branches and Distributers

New York **Norfolk** **Seattle** **Vancouver**
Philadelphia **Baltimore** **Portland, Me.**

The Guarantee of WC

The WC Monogram on Marine Hardware is a guarantee of Dependability. It is a protection to the buyer of boat fittings. Look for it.

WC Oil Compass

Built to withstand the jars of power craft; sensitive and accurate under all conditions. Carefully tested and fully guaranteed. Sizes of dials: 2, 2½, 3, 4 and 5 inch. If not at your dealer's, write us and we will give you the name of a WC Dealer. Also ask us for a copy of our Free Booklet, "Compass Talks and Tests"; or send 20c in stamps and we will inclose with the booklet a handy celluloid Course Protractor.

Get This Useful Book

"Sea Craft Suggestions and Supplies"—287 pages of practical information. Tells what is proper Ground Tackle, gives Compass instructions, hints on Steering Gear, Shaft Bearings, etc., and shows representative line of WC fittings for motor boats and other small craft.

WILCOX, CRITTENDEN & CO., Inc.

4 South Main Street, Middletown, Conn.

ESTABLISHED 1847

Trade Mark Reg.

Money Saved Is Money Made

E. J. WILLIS CO. 85 Chambers St., New York

DOMAN

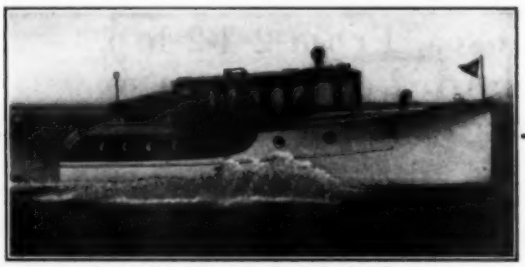
OSHKOSH, WIS.

DOMAN MARINE MOTORS

from 4 to 50 H.P.

There is a size to suit you. Write for literature. Doman engine division of

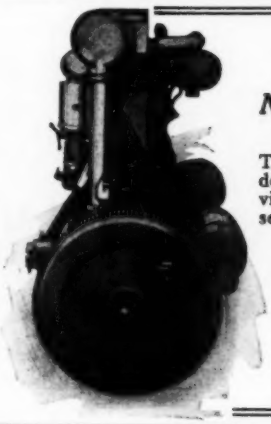
UNIVERSAL PRODUCTS CO.
Oshkosh, Wis.



Rochester 40 Foot Enclosed Bridge Cruiser

High grade cruisers in standard sizes: 36-40-45-50 and 55 feet with either open or enclosed bridge deck.

ROCHESTER BOAT WORKS, Inc.
10 Charlotte Station Rochester, N. Y.



Peerless

New High Speed—Light Weight

The product of experience and development in actual boat service. Extremely light weight is secured by employing special castings and alloy steels throughout.

Bore 5". Stroke 7". Speed 1650 R.P.M.

4 cyl. 125 H.P..... 700 lbs.
8 cyl. 250 H.P..... 900 lbs.
12 cyl. 400 H.P.....1100 lbs.

Peerless Marine Motor Co.
2160 Niagara St. Buffalo, N. Y.

OLOMEL

A Superior Oil and Water Stop Better and Cheaper than Red Lead

Used by Consolidated Shipbuilding Corp., on the

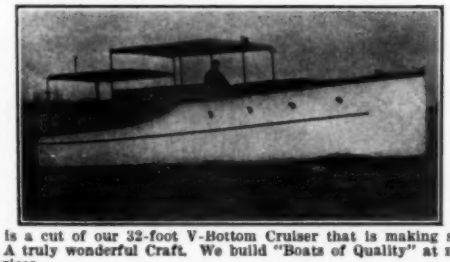
YACHT "LYNDONIA"

also on U. S. Destroyers, and by leading shipyards. Supplied in three forms—Olomel Solution, Olomel Compound and Olomel Putty. We also manufacture Bitumel, Electrimel, Bituminous Enamel, Oxide Iron Paint, Copper Paint, Non-Corrosive Paint, Acid Resisting Paint, Etc.

Write today for full information and prices.

OLOMEL MFG. CO., 18th & HAMPSHIRE STS. SAN FRANCISCO, CALIF.

HARRISON Standardized Boats



This is a cut of our 32-foot V-Bottom Cruiser that is making such a Hit. A truly wonderful Craft. We build "Boats of Quality" at moderate prices.

32-foot Cruiser, 40 H.P. Price including tax.....$4,950.00
20-foot Runabout, 20 H.P. Price including tax..... 1,500.00
10-foot Yacht Tender. Price including tax..... 125.00
16-foot Outboard Rowboat. Price including tax..... 85.00

R. W. HARRISON BOAT WORKS
"Established 1897" Bay View Park, Toledo, Ohio

MAYNARD-ADAMS ENGINE CO.

Eighth and Delaware Streets
Berkeley, California

A high grade 3½ H.P. 4-cycle power plant. Ford replacements.

Eastern Agent
H. A. Westerman,
Riverhead, N. Y.

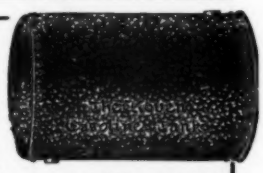
Menge Marine Hardware & Supply Co.,
New Orleans.

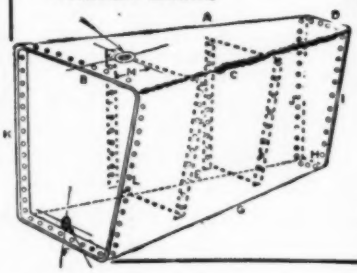
Other agents wanted.

Burns Kerosene or Gasoline $141 to $266

Distributors for South Sea Islands, Burns Philp Co., Sydney, Australia.

Gasoline Tanks, Air Whistle Tanks, Mufflers, Stacks, Special Plate and Sheet Metal Work for Pleasure Boats.





L. O. KOVEN & BROTHER

Main Office,
158 Ogden Ave.,
Jersey City, N. J.

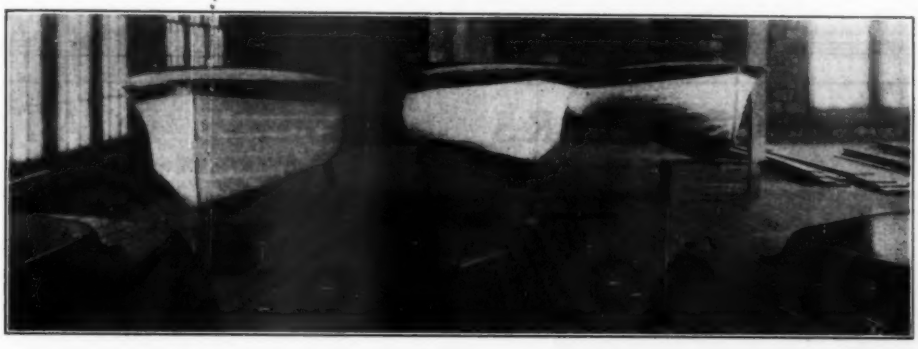
Branch, 50 Cliff St.,
New York City.

Advertising Index will be found on page 118

Hacker Runabouts Getting the Finishing Touches

This picture shows a corner of the big Hacker boat plant at Mt. Clemens, Mich., devoted entirely to producing the famous 21 foot Hacker runabouts. Here are some of the boats getting the finishing touches in paint and varnish.

Quantity production makes it possible to sell this boat for less than half of what it would cost under the one-at-a-time method of building. The beam is 5′ 8″ and draft only 16″ yet the high freeboard and V bottom design makes it very dry and seaworthy. The engine is a 20 H.P. Kermath, electric starting and lighting, giving a speed of 20 miles.



Price only

$1975

Plus tax
F. O. B.
Mt. Clemens

Designed and Built by John Hacker, N. A.

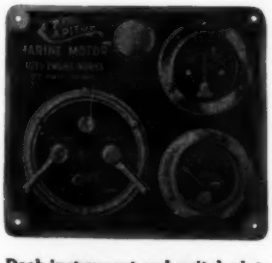
Order early

CENTRAL MARINE SERVICE CORP.
709 VINTON BUILDING **DETROIT, MICH.**

"The Capitol"

A Marine Unit Power Plant

For Speed Runabouts and High Class Cruisers



Dash instrument and switch plate controlling ignition, lights, ammeter, oil gauge and dash lights

COMPLETELY ENCLOSED—COMPLETELY EQUIPPED

FROM the first glance the Capitol inspires the confidence of marine engine buyers. Its clean cut, well proportioned exterior with every moving part enclosed and every accessory built in immediately suggests the fact that it is the product of master designers. There isn't a smoother, quieter running marine engine. Vibration and noise are eliminated by perfect balance of moving parts, wide-faced helical-cut timing gears, force feed lubrication, ball bearing universal joint, three point suspension, and many other improvements over ordinary construction.

Highest Grade Equipment

Delco ignition, Atwater-Kent two-unit starting, lighting and generating system, Willard storage battery, Stromberg or Schebler carburetor, instrument plate shown above and all other necessary equipments are included.

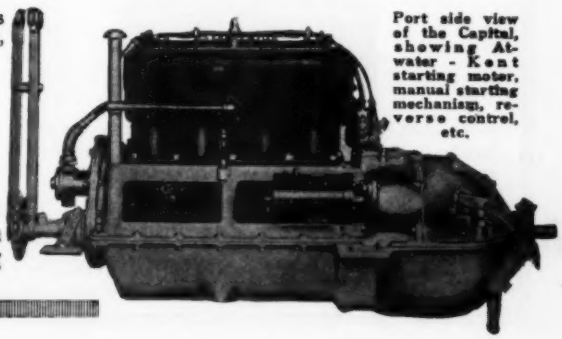
If you own or are planning the kind of a runabout or cruiser that deserves a really excellent power plant, you should know more about the Capitol, its special features of construction and how it is built.

Bore 4¼″	Stroke 5½″
High Speed Model	60-65 H. P. at 2000 R. P. M.
Medium Speed Model	30-34 H. P. at 1000 R. P. M.

Write today for complete description and prices

Auto Engine Works, St. Paul, Minn., U.S.A.

Eastern Representatives: Ventnor Boat Works, Atlantic City, N. J.; Fred C. Duclon, Alexandria Bay, Jefferson Co., N. Y.; Gray-Aldrich Company, Inc., 84 Atlantic Ave., Boston, Mass. Canada: The A. R. Williams Machinery Company, Limited, 64-66 Front St. W., Toronto, Ont.



Port side view of the Capitol, showing Atwater-Kent starting motor, manual starting mechanism, reverse control, etc.

DECK CANVAS-ALL WIDTHS
YACHT SAILS-AWNINGS-SPRAY HOODS-Etc.

522 So. Delaware Ave Philadelphia — GEO. R. BURROWS. Inc. — 2 South St New York

DOES YOUR BOAT LEAK?

Send for Booklets—"HOW TO MAKE YOUR BOAT LEAKPROOF," and "MARINE GLUE—WHAT TO USE AND HOW TO USE IT."—Each grade is for a different purpose. IT IS IMPORTANT THAT YOU USE THE GRADE WE RECOMMEND. Any old boat, so long as the frames are in fair condition, can be made water-tight by following the instructions in the above booklets. This applies to anything that floats, from a canoe to a yacht, wood or steel. Put your leak troubles up to us, we will help you to stop them.

JEFFERY'S MARINE GLUE IN ALL THE VARIOUS GRADES

For Sale by all Yacht, Boat and Canoe Supply Houses, Hardware, Paint and Oil and Sporting Goods Dealers

L. W. FERDINAND & CO. - - - - - - - - 152 Kneeland St., Boston, Mass., U. S. A.

YACHTS -- CRUISERS -- HOUSE BOATS

Experience Teaches—Hence the reason that once an owner of a New York Yacht Launch and Engine Craft always an owner. Many years experience in high class Yacht Design and Construction are at your service.

20th CENTURY MOTORS

400 to 500 R. P. M. Heavy Duty Type Four cycle. Bore 6½", Stroke 8"

2 cyl. 15-20 B. H. P.
4 cyl. 40-50 B H. P.
6 cyl. 65-75 B. H. P.

NEW YORK YACHT LAUNCH & ENGINE CO., Morris Heights, New York City

GENERAL LIGHTNING CUT PISTON RINGS

(1) The Lightning Cut
(2) The Wandering Oil Groove

will absolutely give you equa-radial pressure on your cylinder wall, obviate the loss of compression, and maintain the roundness of your cylinder.

The Wandering Oil Groove not only lubricates the cylinder wall, but effectively lubricates the ring itself, retaining the resiliency of the metal and avoiding friction.

General Lightning Cut Rings are guaranteed to give the best possible results. Properly fitted and used, they will effect economy in many ways. *Write us for further information*

GENERAL UTILITY CO., *Manufacturers*
1326-28-30 Ogden Street, Philadelphia

DEVOE
PAINT and VARNISH
Products

Devoe makes a paint or varnish for every fresh water or salt water boating need. Established 1754

Build Your Own Boat

—cruiser, work boat, open launch or row-boat — from our knock-down frames or patterns.

Save ½ to ¾ the Cost.

Send for Catalog and Tell Us Your Requirements.

DEFOE BOAT & MOTOR WORKS
3220 State Street — Bay City, Mich.

The Compass For Your Boat

should be the best obtainable. For seventy years Ritchie compasses have been the choice of experienced navigators.

Select the Ritchie for your boat.

Our catalog will show you the one best suited for your needs. Send for a copy today.

E. S. RITCHIE & SONS
Established 1850
110 Cypress Street
Brookline, Mass.

Advertising Index will be found on page 118

Do You Want Safety on Your Boat?

Tip It Over, It's Safe!

In the roughest sea or stiffest wind, the new Sterno Stove burns with **absolute safety** and dependability. The fuel cannot spill. Can you say the same of any other boat stove?

Sterno Stove is ruggedly constructed of **galvanized steel** and guaranteed rust proof.

Burns Sterno Canned Heat, the solid non-spillable fuel, in the new, large economy cans.

Just what you want for the Yacht or Motor Boat.

Write now for particulars and prices.

STERNO CORPORATION

9 East 37th Street **New York**

Read What The Insurance Company Says:

Chubb & Son
Managers

Federal Insurance Company
5 and 7 South William Street
New York

In Reply Please Refer to HC

February 21, 1921

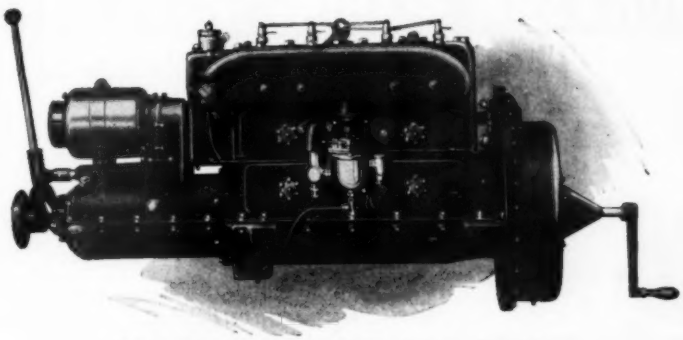
* * * * * *

We are very glad to advise you that in our opinion the Sterno stove, as exhibited to our surveyor, is very satisfactory for its purpose and reduces the risk of fire to a minimum.

Yours very truly,

HC.MF

Also four sizes of two cycle engines for inboard installation. Sizes 2½ to 8 H. P.



Satisfaction guaranteed or your money back. Send for catalog and trial proposition.

Model 44, 14-20 H. P. 4 cyl. 4 cycle.
Showing both electric and hand starter.

Attachable Motor for Row Boats

If you are equipping a boat of 35 feet or under, we make an engine that will handle it properly. We make no pretentions at building racing engines, but confine our efforts to producing the type of engine required for family launch;—engines that carry the refinement such machines should have to give their owners the reliable, smooth running qualities so essential to the pleasant hours of recreation they expect.

The small details so often neglected, are the ones that make or mar the pleasure of ownership. These details are given particular stress in the L—A design and execution.

The model 44 shown, has one small revolving part in sight—the shaft driving the magneto. The attachable engine has no moving part exposed save the magneto flywheel. No soiled hands, no flying grease.

(84)

LOCKWOOD-ASH MOTOR CO., 2107 Jackson St., Jackson, Mich.

LOCKWOOD-ASH
MARINE LA ENGINES

PURDY BOAT COMPANY

Designers and Builders of

EXPRESS CRUISERS

TRENTON MICHIGAN

Improved Motor Boat Closet

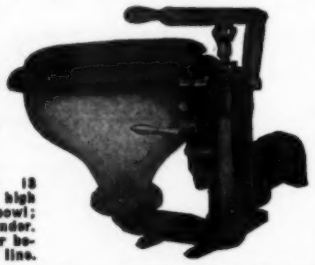


Figure 1404

Dimensions: 18 x 18 x 11" high to top of bowl; 2½" cylinder. For above or below water line.

The best little closet on the market today, possessing many of the advantages of the large size toilet. All brass and porcelain. Oak seat and cover.

All prices subject to market advances, which are continually changing.

THE J. H. CURTISS CO.

The J. H. Curtiss Co.

Pioneer Specialists in Marine Sanitary Fixtures

Since our advertisement appeared in the first issue of MoToR BoatinG, December, 1907, hundreds of Curtiss fixtures have been installed in motor cruisers and yachts of all sizes, including some of the finest boats launched within this period.

The Curtiss line is exceptionally complete, varied in type, size and price to meet every possible requirement. Each model has been designed in accordance with our wide experience in boat work and can be depended upon in quality, service and durability no matter whether it is our highest or lowest priced model.

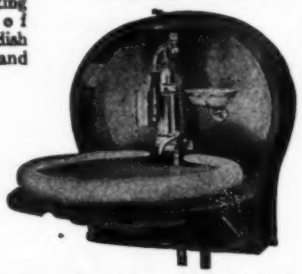
"PRICES ON APPLICATION"

With Pump

Cock on pump swings upward, thus preventing breaking of bowl. Soap-dish is porcelain and removable.

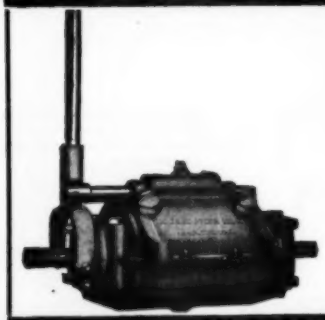
No. 5 Height, 19 in. Width, 19 in. Depth Closed, 6 inches. Quartered Oak Case, or Mahogany Case.

Lining and Fixtures Nickel-plated. Porcelain Bowl. Mahogany or Quartered Oak Case.



2 South Street, New York

THE JOHNSON MARINE REVERSE GEAR



The Four Exclusive Johnson Features

Johnson Friction Clutches

Alloy Steel Gears and Shafts

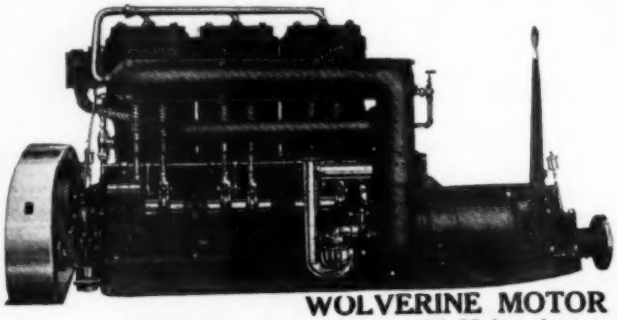
Ball Bearings

Completely enclosed design

Our formula for smooth operation, economy of power, and long, unfailing service.

Write Department 25 for our Catalog

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN



"WOLVERINE"

The Motor with the Bore and Stroke

HEAVY DUTY MARINE ENGINES

KEROSENE { Used successfully for 15 years. Device built into engine.

WOLVERINE MOTOR WORKS

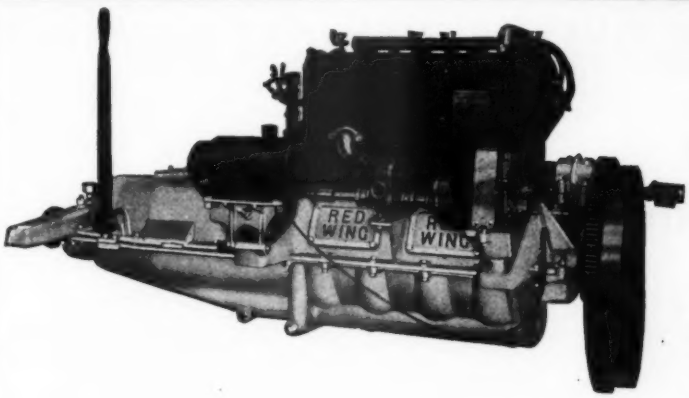
33 Union Avenue

Bridgeport, Conn., U. S. A.

(Formerly Grand Rapids, Mich.)

Catalogue No. 113 gives full information

Advertising Index will be found on page 118



Red Wing Thorobred
THE MOTOR WITH POWER TO SPARE

When Women Drive A Boat

It takes a refined motor to win over the ladies—a motor that is "there" with the touch of a button.

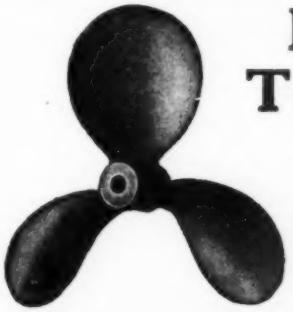
The Red Wing "THOROBRED" is everywhere the favorite with the ladies for that very reason.

If you want an engine that is going to please the "women folks" do not overlook this element, so all-important, in your recreations.

A "THOROBRED" will never disappoint you.

One of our five sizes, from 10 to 40 H.P., is sure to fit your needs. Write today.

RED WING MOTOR COMPANY, Dept. B, Red Wing, Minn., U.S.A.



Hyde Turbine Type Propellers

are stocked in every locality. The following is a partial list of firms carrying Hyde wheels. Consult your nearest dealer for information and prompt, courteous service.

PORTLAND, MAINE
Chas. F. Guptill Co.,
175 Commercial Street

NEW BEDFORD, MASS.
Hathaway Machinery Co.,
North Water & Elm Streets

PHILADELPHIA, PA.
Elisha Webb & Son Company,
136 South Front Street

CRISFIELD, MARYLAND
Clarence Sterling & Son,
1104 Main Street

SAVANNAH, GEORGIA
White Hardware Company,
25 Congress Street, West

NEW ORLEANS, LOUISIANA
Stauffer, Eshleman & Company,
511 Canal Street

WILMINGTON, CALIFORNIA
Fellows & Stewart

PORTLAND, OREGON
Oregon Marine & Fisheries Supply Co., 105 First Street

DETROIT, MICHIGAN
Belle Isle Boat & Engine Company,
East Jefferson & Parkview

CHICAGO, ILLINOIS
W. L. Masters & Company,
229 North State Street

BOSTON, MASS.
Rapp-Huckins Company,
59 Haverhill Street

NEW YORK CITY
W. C. Disbrow, Jr.,
8 Reade Street

BALTIMORE, MARYLAND
Unger & Mahon, Inc.,
Pratt & Gay Streets

NORFOLK, VIRGINIA
Gas Engine & Boat Corporation,
First Street near Front

MOBILE, ALABAMA
Marine Supply Company

HOUSTON, TEXAS
C. L. Bering Company,
1009 Capitol Avenue

SAN FRANCISCO, CAL.
Johnson, Joseph & G. M. Josselyn & Co., 56 Sacramento Street

SEATTLE, WASHINGTON
Pacific Net & Twine Company
1213 Western Avenue

ALEXANDRIA BAY, NEW YORK
Hutchinson Bros.

MILWAUKEE, WISCONSIN
Joys Bros. Company,
201 East Water Street

Write for our booklet "Propeller Efficiency." It contains valuable information. A copy will be mailed on request.

HYDE WINDLASS COMPANY **Bath, Maine**

Not just a FOLDING chair — but a REAL CHAIR that folds.

The Commodore

A LIGHT, RIGID, ATTRACTIVE, EASY CHAIR.

Made Large for Comfort—
25½ inches wide when open
—Folds Small for Convenience
Only 9 inches wide when closed

The frame is made of solid Mahogany finished natural or of Rock Elm stained Forest Green. Aircraft truss construction holds frame rigid yet adjusts seat and back to position of body. Copper fastenings, non-marking rubber leg-tips.

Every cruiser should have a full equipment of these luxurious and convenient chairs—every runabout should have at least two.

Single chair, mahogany	$11.75
6 at one time, each	9.42
Single chair, forest green	8.00
6 at one time, each	6.40

If your dealer does not have COMMODORE FOLDING CHAIRS in stock we will fill your order direct.

ALBANY BOAT CORPORATION
Seventh Street WATERVLIET, N. Y.

The
Automatic Self-Bailer

is absolutely guaranteed to keep your bilge drained, without repairs, adjusting, oil or any upkeep attention, for the life of the boat.

Safety valve handle furnished in any desired length.

For fresh or salt water.

If your dealer cannot supply you write us

ST. CLAIR IRON WORKS
206-212 Witherell St. St. Clair, Michigan

B. Schellenberg & Sons

EVERYTHING FOR THE PERSON OF THE YACHTSMAN, HIS OFFICERS AND HIS CREW

Clubs, yacht owners, commercial boat owners, should take advantage of our many years' experience in outfitting the mariner, both inland and deep sea.

Crews and Club Attendants furnished without Charge.

B. SCHELLENBERG & SONS
99 to 105 Myrtle Ave., near Bridge St.
Brooklyn, N. Y.

The Compass As a Common, Convenient and Correct Companion

(*Continued from page* 64)

the lubberline, and it is imperative that the compass be placed in the binnacle or on the boat so that a line joining the pivot and the lubberline shall be parallel to the keel of the boat. Thus, the lubberline always indicates the compass direction on which the boat is heading.

The Old Card

Generally speaking, there are two methods in use for marking or dividing the compass card, which we may designate for want of better names as the old card, and the new card. On the old card shown in Fig. 34 it will be noticed that the card is divided into 32 major divisions known as points, and that those major divisions are further subdivided into four parts. It will also be observed that the card is divided on its periphery into degrees. It is in the method of putting the degrees on the compass card that the new card differs from the old one.

Degrees

On the old card North and South are both marked zero, and East and West are each marked 90, the divisions running from North and from South towards East and West from zero degrees to 90 degrees. In other words, we have 45 marked opposite Northeast, as well as Southeast, Southwest and Northwest. To steer a course by this method of dividing the card it is necessary to add either the designation North or South to the degrees; that is, if we wished to steer Northeast we should call our course North 45 degrees East, and if we wished to steer Southeast this course would be called South 45 degrees East. Similarly, Southwest is South 45 degrees West, and Northwest North 45 degrees West. One advantage of this method of designating the compass is the ease with which reverse courses may be remembered. For example, if a certain course were North 60 degrees East, then when returning over the same course the compass would indicate South 60 degrees West.

Points

Division of the compass card according to points is a most interesting one, and as it is the method which is generally used by motor boatmen it is the one which will require our greatest attention. As mentioned above, the card is divided into 32 major divisions known as points, each one of these points having a particular name. The four principal, or cardinal points are known as North, South, East and West. The inter-cardinal points are the ones midway between the cardinals, and these are given a name which is a combination of the points which they bisect; that is, the point midway between North and East is known as Northeast, etc. This gives us eight divisions. We now subdivide these eight divisions in half, and once again we give these eight new points names which are combinations of the two points which they are midway between. For example, the point midway between North and Northeast is North Northeast. That point midway between South and Southwest is South Southwest. To get the additional 16 points it is simply necessary to divide points which we have already determined in a similar way as before. Here again the new points will have names corresponding to the points to which they are adjacent. The word "by" will be used in all of these 16 new points. For instance, the point between North and North Northeast is known as North by East, because it is adjacent to North, and in an easterly direction from North. The point between Southeast and South Southeast is known as Southeast by South, because it is adjacent to the inter-cardinal point Southeast, and in a southerly direction from it.

Quarter Points

For the purpose of steering more accurate courses than would be possible by following only 32 points, we must subdivide the points into halves and quarters. The naming of these quarter points is most interesting, and must be thoroughly mastered by the motor boatman at the beginning. Naturally it will be seen that every quarter point might have two names; that is, it might refer to the point either to the right or to the left of it. For example, the quarter point just to the right of North could logically be called North ¼ East, or it might be called North by East ¼ North. Either of these designations would probably convey to the man at the wheel the course which it was desired that he should follow. However, and perhaps unfortunately, there is a certain method of calling these quarter points, and again we are confronted with two methods instead of one.

The older method appears to many to be the most logical one, although the Navy Department has seen fit to adopt one of its own. It makes little difference which of these methods is adopted by the motor boatman. Both are correct.

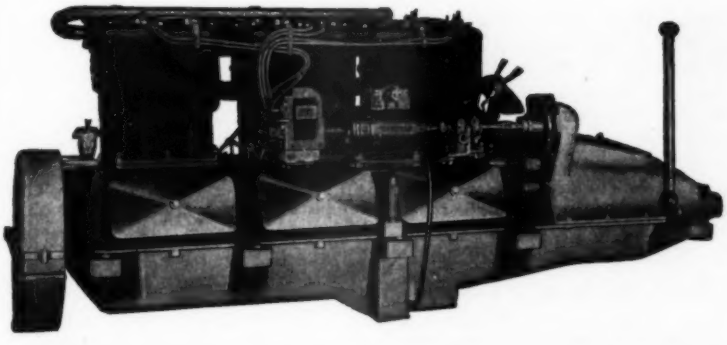
Fig. 35 shows the two methods of naming the quarter points, and in it Fig. I shows the older method. This system is to name the quarter points from each cardinal or inter-

(*Continued on page* 106)

Advertising Index will be found on page 118

Next Year's Engine *and* Next Year's Price—*Now*

NO need for further waiting—enjoy the rest of the present season and be set for next year, with the confidence and assurance that you have a 1922 motor at a 1922 price.



In order to show the world the reliability of our motors we built "The Detroit," a 35' x 8' motor boat equipped with a 12-15 H.P. SCRIPPS MOTOR and ran her, under her own power every inch of the distance from Detroit, Michigan to St. Petersburg, Russia (now Petrograd). The start was made from Detroit on July 2, 1913. She arrived in St. Petersburg, September 13th, 1912—6008 miles with **absolutely** no trouble. Ask Thomas Flemming Day, her skipper or Walter Moreton of Boston—they will tell you.

No other manufacturer has dared to attempt a similar demonstration of reliability.

A Scripps Motor will run when nearly upside down, as demonstrated by Larsen's trip through the Niagara Rapids in October, 1911.

Do these wonderful demonstrations of reliability and stamina mean anything to you?

The Scripps "D" Series with marked refinements and added conveniences is now ready, the finest motor ever produced by a reliable, established manufacturer that has been building the world's best for 17 years.

And the new low level prices set a standard of value beyond any competition, power and equipment considered.

Concentration, standardization, a year around manufacturing schedule and low overhead alone makes Scripps values possible.

Investigate carefully and install the reliability and endurance for which the Scripps has been famous for years, coupled with pep, power, clearness, quietness, and smoothness of operation.

There are Scripps power plants for every type of boat, commercial or pleasure, in two, four and six cylinder, gasoline or kerosene, 10 to 125 H. P.

SCRIPPS MOTOR COMPANY

5819 Lincoln Ave. **Detroit, Mich.**

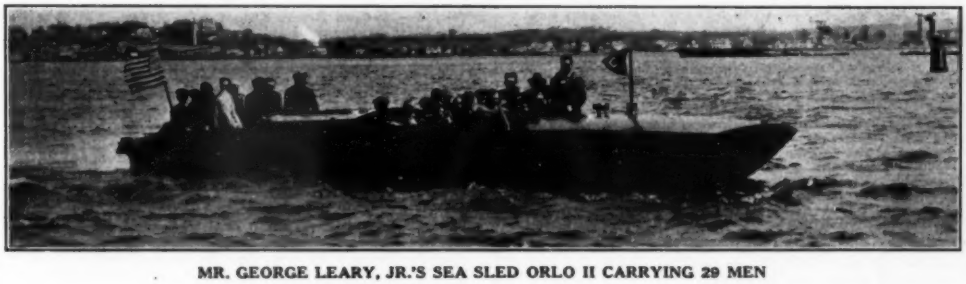
Inverted V-bottom and Surface Propeller Boats

SEA SLED

Hickman Patents in all countries

Trade Mark Reg. U. S. Pat. Off.

Sea Sled design has advanced more rapidly than did motor-car or airplane design



MR. GEORGE LEARY, JR.'S SEA SLED ORLO II CARRYING 29 MEN

Designed as a racing runabout. within the Fisher Trophy limits, and bettering all screw propeller displacement boat records by miles.

In weight-carrying tests **Orlo II** carried 29 men (passenger weight 4759 pounds) at speeds of 33-35 miles per hour **and without heavy load on the engines.**

More important, **this load can be carried economically at all lower speeds.**

This is a revolutionary accomplishment in motor boat design.

THE SEA SLED COMPANY

WEST MYSTIC, CONN.

MoToR BoatinG Books for Boatmen

All Published by MoToR BoatinG—All Non-Technical and Authoritative

MOTOR BOATING PRACTICAL HANDBOOKS—6 VOLUMES

Volume I —Practical Motor Boats and Their Equipment.....$1.50
Volume II —Practical Motor Boat Building 1.50
Volume III —Practical Things Motor Boatmen Should Know..... 1.50
Volume IV—Practical Marine Motors..... 1.50
Volume V —Practical Motor Operation and Maintenance..... 1.50
Volume VI—Practical Suggestions for Handling, Fitting Out and Caring for the Boat..... 1.50

The books measure 7 x 10 inches and are handsomely bound in cloth. Over 1,000 pages. Price of Practical Handbooks $1.50 per volume or $7.50 per set of Six Volumes.

THE IDEAL SERIES

Volume I—Designs of Ideal Motor Boats and How to Design a Motor Boat.....$2.00

This volume describes in detail how to design a motor boat. It also contains complete plans of 30 Cruisers, Runabouts and Auxiliaries. The plans include lines, table of offsets, interior plans, profiles, construction details, etc. There is no book published at the present time which describes in everyday language the details of designing a boat according to your own tastes. The plans of Ideal Cruisers, Runabouts and Auxiliaries are complete in every particular. They include the best of the plans published in MoToR BoatinG during the past several years. The plans include boats of from 20 feet in length up to 40 feet. The drawings are all to scale and large size.

Volume II—How to Build Sixteen Ideal Motor Boats $2.00

This book gives complete information for building the following boats:

10-foot mark boat, 12-foot outboard motor boat, 12-foot speed boat, 12-foot bangabout, 13-foot sea skiff, 16-foot sharpie, 18-foot runabout, 20-foot monoplane, 20-foot hydro-runabout, 20-foot knockabout, 20-foot tunnel stern, 22-foot V-bottom runabout, 25-foot V-bottom cruiser, 28-foot round-bottom cruiser, 28-foot cruiser (Consort II).

Every article is fully illustrated with working drawings and no information or instructions are missing which would be of assistance to the novice to build his own boat.

Both of the Ideal Books are printed in large type on extra fine paper. They have been edited by Charles F. Chapman, editor of MoToR BoatinG.

Price of Ideal Books, $2.00 per volume or $5.00 per set of 3 volumes.

A New Book of Boat Plans
Twelve Complete V-Bottom Designs
Ideal Series, Vol. 3
by William H. Hand, Jr.

Plans Prepared Expressly for MoToR BoatinG

This new book is the most valuable ever published for the amateur builder or anyone desiring to have a V-bottom boat built by his own builder.

The plans contain outboard profile, lines, inboard, construction and interior arrangement plans, sectional views and complete table of offsets. Accompanying each design is a description of the boat and a full set of specifications taking up step by step each feature of the boat's construction, how it should be built and the proper material to use.

Plans and specifications of the following boats are included: **Edith, a 15-foot runabout; Jane, an 18-foot runabout; Katharine, a 30-foot cruiser; Dorothy, a 25-foot runabout; Zenith, a 25-foot cruiser; Cyclone, a 36-foot auxiliary; Eclipse, a 40-foot express cruiser; Magnet, a 28-foot cruiser; Tornado, a 45-foot auxiliary schooner; Broncho, a 29-foot cruising runabout; Shark, a 21-foot utility runabout; Claire, a 36-foot express cruiser.**

Price of Twelve Complete V-Bottom Designs...$2.00

(If ordered with the 2 other volumes of the Ideal Series, the price of the 3 books will be $5.00.)

Motor Boatmen's Charts and Log Sheets

Published by MoToR BoatinG

Charts printed on heavy cardboard 8½" x 11" and punched to fit standard loose leaf folder.

Contain name and location of all principal ports and harbors, distances, compass courses and sailing directions. Invaluable for use on small boats and motor yachts. The set now includes the following charts:

Series A

No. 1—Western End of Long Island Sound.
No. 2—Eastern End of Long Island Sound.
No. 3—Block Island Sound.
No. 4—New York Harbor.
No. 5—Boston Harbor.
No. 6—Buzzards Bay.
No. 7—Block Island to Vineyard Sound, including Narragansett Bay.
No. 8—Delaware Bay.
No. 9—Chesapeake Bay, Part I, Upper Part.
No. 10—Coast of Maine, Portland to Rockland.
No. 11—Hudson River, Kingston to Albany.
No. 12—Chesapeake Bay, Part II, Central Part.

Series B

Series B Charts Nos. 13 to 24 are in the course of preparation, and will be forwarded as ready. Series B is as follows:

No. 13—Lake Erie—Eastern Part.
No. 14—Lake Erie—Western Part.
No. 15—Hudson River, New York to Kingston.
No. 16—Lake Champlain.
No. 17—Erie Barge Canal.
No. 18—Massachusetts Coast.
No. 19—New England—Newburyport to Portland.
No. 20—Cape Cod Bay.
No. 21—Maine, Monhegan to Eastport.
No. 22—Chesapeake Bay, Part III, Lower Part.
No. 23—St. Lawrence River and Thousand Islands.
No. 24—Biscayne Bay.

MoToR BoatinG has also published a log sheet to fit the standard 8½" x 11" loose leaf folder. Each sheet contains spaces for such data as time of passing various aids to navigation, names of aids, magnetic and compass courses, distances, patent log readings, speed of boat, revolutions of motor, wind direction and force, condition of weather and sea, depths of water, fuel, time of high and low water, etc., etc.

Prices

Charts 25 cents each or $1.50 per set of 12 (Series B will be sent as published).

Log sheets $1.00 per set of 50 sheets.

Loose leaf binders (canvas bound) to hold charts and log sheets, $1.75.

Prices for all books of Practical Series, Ideal Series and V-Bottom Designs. Nine books in all.

If Purchased Separately.....$15.00 If ordered all at one time..... 11.00
All Books, 24 charts, log sheets and binder. Ordered together 15.00

MoToR BoatinG, 119 West 40th Street, New York

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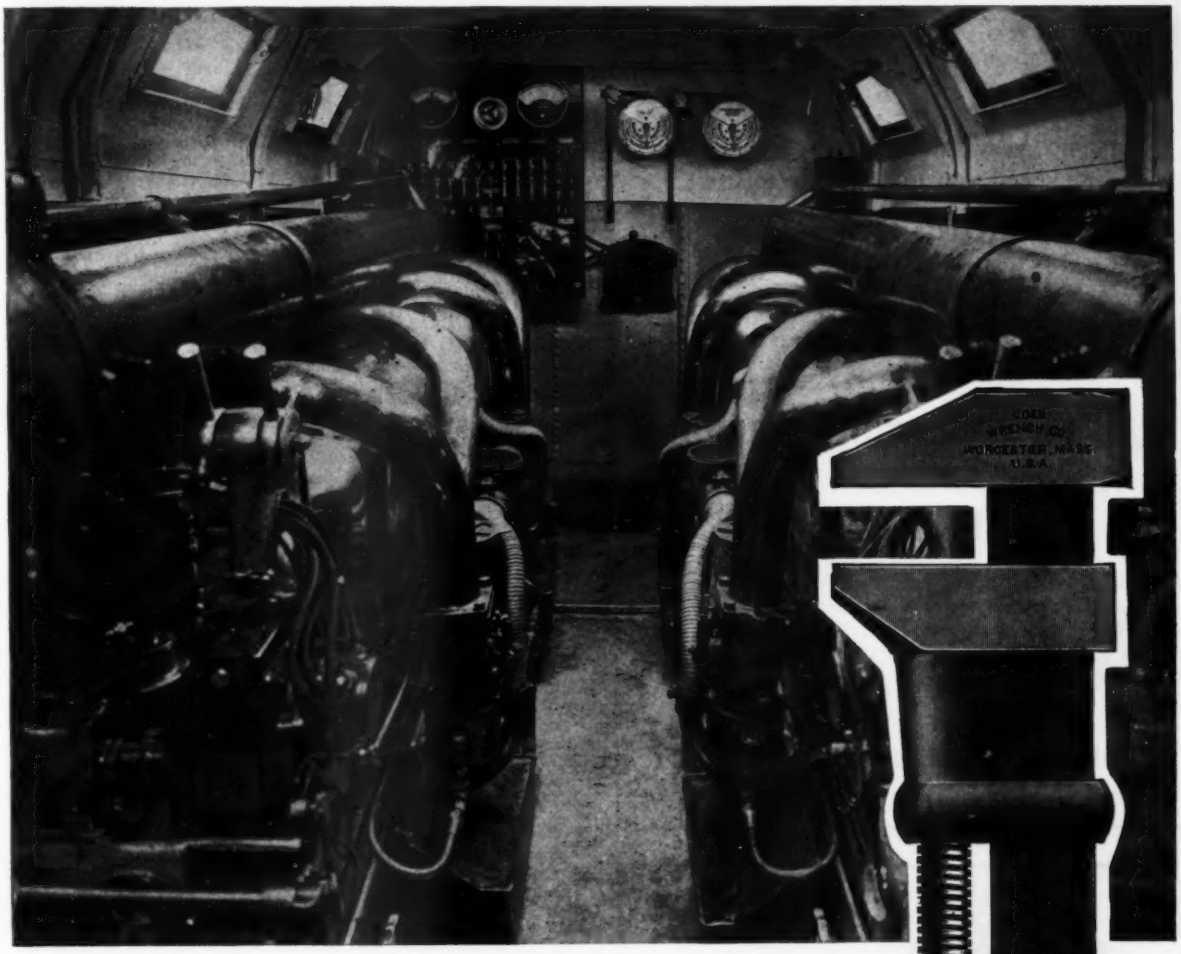

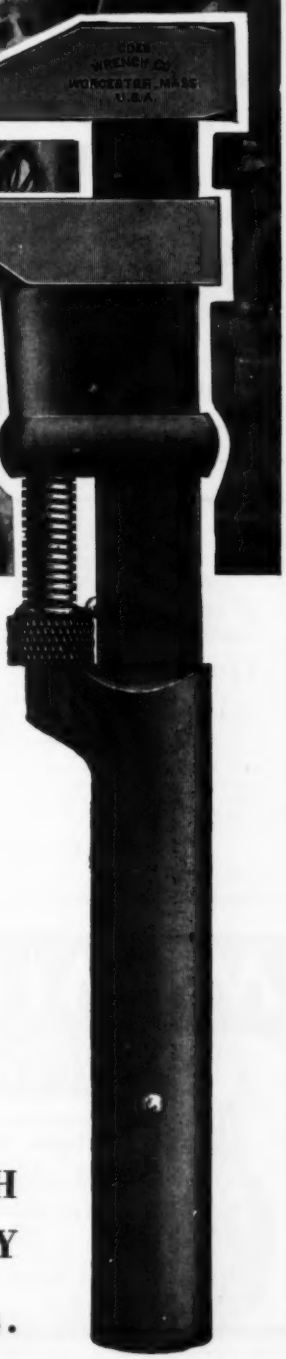

Power, Strength, Coes Wrenches Quality, Ability and Satisfaction

You choose your power-plant after great deliberation and much thought.

It Must be the Best.

Then a set of COES WRENCHES and you have all that money can buy.

Eight sizes, all steel, from 4″ to 21″ and made for real work. Ask your dealer.

TRADE MARK
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Coes

COES WRENCH COMPANY

Worcester, Mass.

Vibration

may be very pronounced at the very engine speed you most desire to use.

MARINE MOTORS

will not be subject to

"PERIODS"

if crankshaft and propeller have been balanced on an

NA Balancing Machine

If either are unbalanced, there is bound to be

Vibration

WE SOLVE VIBRATION PROBLEMS

Trade Mark Registered

Boatowners want easy riding crafts—motor manufacturers and boat builders can provide them, by seeing to it that the motors are balanced on

NWA Balancing Machines.

VIBRATION SPECIALTY COMPANY

Harrison Building **Philadelphia, U. S. A.**

NAVARRE

The Quality Binocular—

Special Price $37.50

HERE is your opportunity to get a high grade binocular at a low price. Standard 6 power 30 m/m—specifications adopted by all armies in World War as most efficient under all conditions. Adjusts to strength of each eye. Extremely light. Made by master craftsmen. Beautiful satin finish; heavy leather, velvet-lined case; will attract attention anywhere. Genuine GRAF LENSES. Only instrument constructed of brass—no clouding of lenses as is the case with ordinary aluminum-frame instruments. War contract cancellation price—$37.50—including war tax. Sent C. O. D. or upon receipt of money order for 3 days' trial. Money immediately refunded if you are not entirely satisfied. For further particulars write to

THE NAVARRE COMPANY

710 J.M.S. Bldg. **South Bend, Ind.**

McMILLAN YACHT BLOCKS

Lignumvitae and Ash
Highly finished

All style fittings

Made in small and large sizes

Refer to Dept. Y

W. H. McMillan's Sons

153 South St. **New York** **40 Penn St.** **Brooklyn, N. Y.**

Penguin—A 25-Foot Auxiliary Sloop

(*Continued from page* 39)

Transom to be two thicknesses of ⅞ inch white pine, cedar, cypress, or oak, seams overlapped, fastened by brass screws, heads countersunk and plugged. Knee fastened on center framing piece.

Sheer clamp: To be of yellow pine, fir, spruce, or other similar wood 1⅛ x 4½ inches, tapered at ends, secured to 1½ inch oak breasthook at stern and fastened to each frame by galvanized rivet and boat nail. To be in one length each side of boat.

Chine Log: To be of yellow pine 1¼ x 3 inches secured to each frame by galvanized rivet.

Cabin Floor: To be ¾ inch pine laid with loose boards in floor each side of center-board trunk for access to bilge.

Engine Foundations:: To be entirely of white oak 2½ inches thick.

Bed Log and Floor Timbers: Latter secured to keel by long galvanized drift bolt, bed log jogged over floor timbers and riveted to same by ⅜ inch diameter galvanized rivets. Limbers to be cut in floor timbers.

Mast Step: To be oak 1¼ inches thick, molded as deep as possible under flooring, to be fastened to floor timbers. Mast to be cut at lower end to fit over step and fastened with one inch diameter galvanized bolt with washers under head and nuts. Above bolt galvanized iron band to be fitted to reinforce mast.

Deck Beams: Forward and aft decks to be framed out with 1¼ x 2 inch oak beams, spaced and crowned as per plan.

Shelf: Inboard of clamp shall be of yellow pine shelf 1¼ x 5 inches secured to clamp by ⅜ inch galvanized rod riveted each end. Between shelf and deck shall be two planks to fill in space, nailed to shelf.

Sheer Ribband: At sheer line a 2 inch white oak half-round to be fastened by long drift bolts, heads countersunk and plugged.

Ceiling: Where shown in spaces in view in cabin ½ x 2½ inch tongued, grooved and V-d cypress sheathing to be fastened to frames by escutcheon pins or brads.

Deck Planking: To be ⅞ inch white pine, cypress or fir nailed to beams, heads punched in, decks planed, and covered with 8 oz. canvas laid in thick wet white lead paint, edges turned up against house coaming under covering piece and turned down over side of boat and fastened under sheet ribband. Care to be taken that canvas is unbroken where turned up at house side so as to render seam at deck watertight.

Chock Rail: On forward deck a 1⅛ inch wide oak chock rail to be secured by long drift bolts driven into clamp, head countersunk and plugged.

Cabin House: Sides and forward end to be 1⅛ inch cypress in not over two boards to form each side and end, boards to be fastened together between windows by 5/16 inch birch dowels. At forward corners oak corner posts to be fitted, these to be rabbetted for side and end coamings to which they are to be brass screw fastened. Coamings to be fastened to shelf and filling by brass screws 3½ inches long, head countersunk only where exposed, to be flush under reinforcing pieces. Screws to be spaced about 8 inches apart. Coaming at forward end of house to be mounted on top of deck and to be secured by ⅜ inch diameter galvanized rods spaced about 12 inches driven down through beam and riveted. Between windows reinforcing pieces one inch thick to be screw fastened to coaming, edges to be chamfered. Openings for windows to be cut with rabbet ½ x ½ inch at bottom into which window sash will fit. At upper and lower side of house, ½ inch oak finishing pieces to be fastened. On inner side at top a ¾ inch oak finishing piece to be fitted under beams. Window sashes to be oak one inch thick glazed with heavy glass. Window sashes to have at top on each end pin fitting into slot in brass plate secured on side of opening so that sash lifts up to clear rabbet and then hinges up to roof, to which it is hooked. Each window to have hook on inside.

Cabin top beams to be white oak sided 1⅛ inches, molded 1⅜ inches, spaced and crowned as per plan. To be notched into house side and fastened and ends covered by ½ inch oak finishing piece and one inch oak half-round. Cabin top to be ¾ inch white pine or cypress, tongued, grooved and V-d on under side, nailed to beams, and covered with 8 oz. canvas in one piece, canvas carefully smoothed and edges turned down over edge of cabin top and tacked. At companionway canvas to be turned up at opening and tacked under finishing piece.

Cockpit Floor: Beams to be 1⅛ inch x 2 inches, flush hatch framed out same size, spaced as shown and without crown. Flooring to be one inch white pine.

Box over Motor: To be made of 1½ x 1½ inch oak framing with ½ inch tongued and grooved cypress. Cover to be one inch thick framed out with 1½ x ½ inch framing and arranged to lift off. Sides arranged to hang down, to be hooked in place to allow access to motor.

Bulkheads: To be ⅞ inch tongued, grooved and V-d cypress.

Cockpit Coaming: To be ¾ inch cypress or oak, tongued, grooved and V-d staving surmounted with 1 x 1½ inch oak cap.

Cabin Transoms and Cockpit Seats: To be 1½ x 1½ inch oak

(*Continued on page* 84)

Advertising Index will be found on page 118

"CONSOLIDATED YACHT TENDER

YACHT owners the world over appreciate a carefully balanced, sturdily constructed power tender. Reliable under all conditions, it displays a seemingly limitless power reserve —fast, seaworthy and safe.

Built with the same grace of line and nicety of appointment that characterizes all "Consolidated" pleasure craft.

We are now exhibiting in our showrooms at Morris Heights, Tenders for immediate delivery.

Complete specifications sent upon request

CONSOLIDATED SHIPBUILDING CORPORATION
MORRIS HEIGHTS, NEW YORK CITY

ONE HAND
Operates It!

The Carpenter
Searchlight Control

Will prove itself to be the most convenient and useful appliance on your boat.

The only device which enables you to throw the light up or down in any direction with *one hand.*

It is described in the new edition of our MARINE CATALOG No. 103 A. Send for a copy. Forwarded Free.

GEO·B·CARPENTER & CO.
MARINE SUPPLIES
200 W. Austin Ave., Chicago

Pull, Push and Twist Operates the Lamp from Right to Left and Up and Down.

"Those who go to sea must be able to see."

Comet Marine Generators

A NEW LIGHTING UNIT

for the open motor boat or any installation where it is not convenient to install a regular switchboard.

MS Control on T-65 Generator

Comet Generators with MS CONTROL combine in one unit generator, reverse current relay, switch and fuse.

MS Control may be mounted on any size Comet Marine Generator. Easy to install, simple and efficient.

Send for Bulletin No. 5.

COMET ELECTRIC CO.
1241 St. Paul St. Indianapolis, Ind.

Penguin—A 25-Foot Auxiliary Sloop

(*Continued from page* 82)

framing, ⅜ inch pine tops, ½ x 2½ inch, tongued, grooved and V-d staving with ½ inch oak finishing pieces top and bottom.

Companionway: Door sill and jambs to be 1⅛ inch oak, doors to be one inch frame with ⅜ inch panels, to be fitted with ship's lock set with round or oval knobs. Slide to be framed with 1⅛ x 1⅜ inch oak with slide of one inch oak.

Cushion: To be 2½ inch, khaki covered, kapoc filled, reversible.

Lockers, Shelves, etc: To be constructed of ⅝ inch cypress.

Steering Gear: Steering wheel to be 24 inch diameter, galvanized with oak handles, fitted with drum to which shall be connected ¼ inch diameter, steel wire rope, wound around drum and led to 3 inch side wire rope blocks and then to galvanized tiller. Ropes led so that when wheel is moved toward starboard side the bow will be moved in the same direction.

Rudder: To be of white oak 1½ inches thick, securely fastened together by iron rod dowels hung on screw rudder braces. At bottom or heel of rudder one inch brass pin to be secured to pass through hole in 2 inch x ⅜ inch brass strap on keel and held by cotter pin.

Plumbing: Water closet installed under hinged seat cover as shown. Enameled iron lavatory with basin pump to be installed on bulkhead, with drain overboard fitted with check valve. Enameled iron sink 12 inches x 12 inches to be installed as shown and fitted with discharge outboard fitted with check valve. Rotary hand pump, smallest size, to be mounted on bulkhead and piped to bilge and outboard. Two galvanized 12 x 30 inch, 12 gallons fresh water tanks to be installed with vent, filler pipe and plate outlet piping to tee, thence to pumps at lavatory and sink to be installed. To be securely chocked in place.

Fuel Tanks: Under seats two 25 gallon 12 x 48 inch cylindrical seamless steel tanks to be installed in pine chocks, securely strapped in place, and fitted with vent, filler pipe and plate in seat, top and outlet.

Spars: Mast, gaff, boom, bowsprit club on job, etc. to be of Oregon pine or spruce of dimensions shown. Mast to be stepped securely. Bowsprit secured by galvanized strap 2 inch x 2⅛ inches at stem and by bolts there and fitted into Kelley Windlass.

Sails: To be of 8 ounce duck made in best manner. Mainsail laced to boom and gaff, attached to mast hoops, and jib snap hooked to forestay. Khaki cover for mainsail and jib.

Rigging: To be as per plan. Bobstay to be spliced over bowsprit and attached to four inch bobstay shackle on stem, stay set up by turnbuckle. Bowsprit shruds spliced over shoulder at end of bowsprit and set up by turnbuckles to 5 inch galvanized eye plates. Cabin plates for side stays to be 12 inch long galvanized iron. All standing rigging to be best plough steel galvanized wire rope, all running rigging to be best manila rope of size shown. All stays over spars to be eye spliced and served with marlin. All necessary cleats, travelers, fairleads, etc. to be provided to lead all halyards, sheets, downhauls, etc. to within easy reach of the cockpit. Downhaul to be provided for mainsail and job.

Hardware and Equipment: Galvanized four inch chocks in chock rail. Galvanized 2½ inch chain deck pipe on forward deck. Kelley patent windlass, size No. 2. Two 5 inch galvanized hinged air ports. One dozen bronze coat and hat hooks. One dozen brass one inch cup hooks. Necessary butts, cupboard catches, drawer pulls, etc. for joinerwork. One 8 foot boat hook, one 4 inch liquid compass. One fire extinguisher, one lignum vitae mast truck with flag halyards. One 2 x 3 foot American yacht ensign, fog horn, whistle, six life preservers, 2 sets Pilot Rules, set of oil running and anchor lights. One 50 pound kedge anchor and sufficient manila cable to suit cruising waters. Galvanized iron ¾ inch diameter mooring hook to support anchor under bowsprit. Anchor chocks both sides of bowsprit, two 30 foot one inch manila docking lines. Fogbell, 6 inch size. Two galvanized bitts on aft deck. Stove, two burners of owner's selection.

Painting and Finish: Entire interior of hull to be given two coats of priming paint. Exterior of hull to receive one coat of priming paint and at least three coats of yacht white above the painted water line and at least two coats of anti-fouling copper paint below. Cabin to be finished in at least four coats of flat white with trim of oak or cypress to suit taste. All interior natural finish to be given at least two coats of interior varnish. All exterior natural finish to receive three coats of spar varnish. Deck and cockpit floor and cabin top to be given coat of priming paint and three coats of gray and salmon paint. All lockers, space under transom, etc. to have ventilating holes. All chips, shavings, loose hardware, nails, etc. dirt and water to be removed from boat before final painting and painting shall only be done on dry surfaces without dust, sawdust, etc. blowing about. Prior to launching boat should be given a water test, i.e., fill the bottom nearly up to the cabin floor with water and any serious leak can then be detected.

Advertising Index will be found on page 118

DIESEL ENGINES for PLEASURE YACHTS

IDEALIA, 84′ x 14′ x 3′, is powered with a 120 H.P. NELSECO Diesel engine which drives her 14¼ miles per hour, using only six gallons of fuel oil per hour. It would take 15 gallons of gasoline to produce the same power, *at approximately ten times the cost.*

Everyone concedes the advantages of Diesel engines for commercial boats. The case of Idealia and other successful installations prove that NELSECO engines are equally suitable for substantial pleasure yachts and large cruisers.

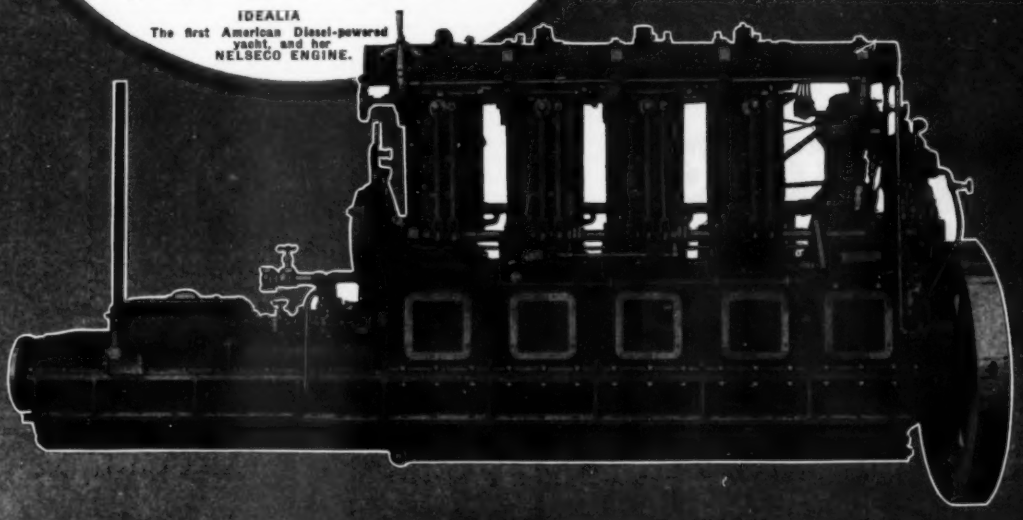
The broad experience of this company, the first to build a Diesel Engine in America for marine use, is at the disposal of those who are interested in investigating or planning a Diesel powered boat. Our engineers will take pleasure in working out your power problem if you will put it up to them. 120 B.H.P. to 3400 I.H.P.—over 150,000 B.H.P. in use or on order.

Let us send you complete information.
Give us the details of your boat.

THE NEW LONDON SHIP & ENGINE COMPANY
Groton, Conn., U. S. A.

Pacific Coast Office: 402 Exposition Bldg., San Francisco, Calif.

IDEALIA
The first American Diesel-powered yacht, and her NELSECO ENGINE.



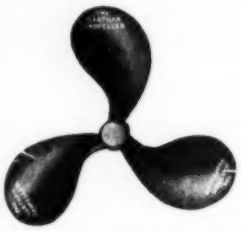
GENUINE
HARTHAN
TRUE SCREW
PROPELLERS

The principle of a True Screw is strictly followed out in the patterns from which all genuine Harthan Propellers are made. This type is known to be the most efficient.

Harthan wheels are made of a special bronze composition, very tough and strong. This allows a very thin blade, the edges of which are brought down very sharp, which, with the extra high polish, reduces the power-absorbing element to a minimum.

We can supply propellers with two or three blades, in practically any pitch, either right or left hand.

Look for the Trade-Mark on Each Blade
McFARLAND FOUNDRY & MACHINE COMPANY
1100 Willow St.,
TRENTON NEW JERSEY
Representatives
NEW YORK: Topping Bros., 121 Chambers Street.
PHILADELPHIA: F. Vanderchercken's Sons, 7 N. Water Street.

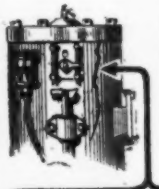


30 M.P.H. GUARANTEED
$650 COMPLETE

Newest Sensation. Airplane drive. 20 H.P. aircooled motor. From 12 to 15 miles per gallon. Runs in 2 inches of water. Capable of over 35 M.P.H. Write for photos and description. Immediate deliveries.

AERO-BOAT COMPANY
La Crosse, Wis., U. S. A.

SMOOTH-ON
IRON CEMENTS
Cut Repair Expense



by using Smooth-On Iron Cement No. 1 for repairing cracks in waterjackets, scored cylinders, leaky screwthread joints, etc., in fact, for any repairs around the engine of your craft.

Smooth-On will make repairs easily and quickly with only a few cents expense.

Send for Free Motor & Home Repair Booklet No. 266—shows many uses to which Smooth-On Iron Cement No. 1 can be applied around motor boats.

Sold by Supply Houses
SMOOTH-ON MFG. CO.
Jersey City, N. J., U. S. A.

REPAIRS CRACKS

Correspondence Course Attracts Attention

(*Continued from page 28*)

of far greater value than in any book of any nature published by private individuals. The price of the Government publications is very small indeed. The Light List of the Atlantic and Gulf Coasts costs only thirty cents. The Buoy Lists for the several Lighthouse Districts are twenty cents each. The Atlantic Coast Tide Tables cost ten cents and the Chart Catalogs are free. Each volume of the Coast Pilot sells for fifty cents.

While there are agencies in most of the larger seaport and Great Lakes cities yet, perhaps, the easiest way to get the publications is to write to the Division of Publications, Department of Commerce, Washington, District of Columbia, enclosing the price of each.

Of course it is not necessary to even mention that each student should have a copy of the Pilot Rules which are distributed free from any of the agencies or may be obtained at any of the Customhouses. Much of the data which appeared in the previous lessons of this course was obtained direct from the Pilot Rules. There is also considerable other data which is of value to the motor boatmen which will be found in the Pilot Rules and which was not included in previous lessons. A knowledge of the Pilot Rules will be necessary in answering several of the questions of Lesson No. 5.

On account of lack of space in the last lesson we were obliged to omit a discussion of some parts of the subject which really belong to the subject matter of Lesson No. 5. We will, therefore, include that in these pages which should be considered as an addenda or appendix to Lesson No. 5 and should be carefully studied before attempting to answer the questions on Lesson No. 5.

The Board of Steamboat Inspectors have charge of the granting of all licenses and the inspection of hull and machinery of those motor boats where this is required. A list of the officers of the local inspectors will be found in table 1B. These are the localities where application should be made for license or inspection.

The Bureau of Navigation, Department of Commerce, is charged with the duty of seeing whether the proper Government equipment is aboard every motor boat while underway. The license and navigation inspectors of the Bureau of Navigation, Department of Commerce, may be assisted in this equipment inspection work by Customs officers and members of the Coast Guard.

It should be remembered that in this matter of equipment the Government has jurisdiction only when boats are underway. A boat at anchor or on shore or tied to the wharf is not obliged according to the law to have any Government equipment on board. Therefore, inspection officers have the right to make an inspection only when they have seen the particular boat underway immediately preceding inspection or have good reason to believe that this boat had been underway immediately preceding the inspection. A boat of an inspection officer or having an inspection officer on board will fly the flag of the Bureau of Navigation or that so-called Customs flag or the flag of the Coast Guard according to which particular officer she has on board.

The Government does not require that the owner of a motor boat or yacht of any size whatever shall have any knowledge of his boat or navigation or the handling of his boat. Neither does the Government require that a motor boat or motor yacht of any size not engaged in trade or not carrying passengers for hire should have on board a licensed officer. Neither are boats of this kind subject to inspection.

For the benefit of those who seem to think that the act requiring the numbering of undocumented vessels was discontinued with the ending of the war, we would explain that this is most emphatically not so, and every boat which requires a number must be provided with one. First, this number regulation took effect on December 7, 1918, and was in no sense a war measure. From this date on every *undocumented* motor boat, either pleasure or commercial, operated in whole or in part by machinery on the navigable waters of the United States, was required to be numbered.

The only exception being public vessels and boats under 16 feet in length when temporarily equipped with detachable motors. A boat with a portable motor must be numbered as well as a boat under 16 feet equipped with a permanent engine. Motor dinghies take the same number as the parent boat when there is one. When there is no parent boat, the dinghies are required to have a separate number.

Documented motor boats, including registered, licensed, and enrolled boats, and motor boats of over 65 feet in length or 16 tons gross burden or over are not required to be numbered.

The process of obtaining a number is simple. Application

(*Continued on page 90*)

Advertising Index will be found on page 118

In Price, Appearance and Performance Here Is the Season's Big Sensation

THIS is the standardized 26 foot Express Runabout, designed and built by Chris Smith, the "speed wizard of Algonac." Every detail is the result of his many years of successful boat building with the result that this wonder boat embodies the best points of the best boats yet sells for about one-half of what you would expect to pay for such a boat. Standardization alone has made possible the comparatively very low price.

We invite you to compare the design, workmanship and performance with any other boat to be had at any price knowing that at every point this Smith boat will prove to be an easy winner.

For example, in design there can be no question as to Chris Smith's genius—one has but to recall the wonderful success of his national and international champions, Miss America, Miss Minneapolis, Miss Toronto, Miss Detroit, Gar, Jr., Gar, Jr. II and many others.

In workmanship, it has been an outstanding feature of all Smith boats that they have always stood up under the hardest tests yet are most beautifully finished.

In performance, there is no other 26 foot runabout with a 4 cylinder engine that can equal the speed of this boat, take the short turns so cleanly, be so absolutely dry and seaworthy and ride so comfortably.

Its length is 26 ft., the beam 6 ft. 6 in., draft 22 in. V bottom, double planked, fully equipped for fresh and salt water. Seating 8 people comfortably. Guaranteed speed 30 miles (the tests showed 35 miles).

The power plant is the Hall-Scott 5¼ x 7 four cylinder 100 horsepower engine, complete with electric starting and lighting, standard reverse gear, water cooled exhaust manifold, 160 ampere hour battery. In fact a complete and perfectly operating power plant in every way.

The price on the standard finish boat (painted hull with mahogany trim) is only $3,950 f.o.b. Algonac, Mich., plus war tax. The special finish of full mahogany is $500 extra. Orders should be placed promptly to avoid disappointment from late delivery.

Address all inquiries for Smith built boats to

CENTRAL MARINE SERVICE CORP.

723 Vinton Building **Detroit, Mich.**

If you don't want to miss

The cruise of the Hippocampus—MoToR BOATING's exclusive story of Alfred F. Loomis' record making voyage.

The William J. Deed designs of easy-to-build motor boats.

The MoToR BOATING Correspondence Course in Small Boat Handling—the biggest hit ever made by a boating paper.

Pages full of practical suggestions in "The Way We Would Do It".

Special off-shore and harbor charts for motorboatmen.

The interesting and practical "Build a Boat Department".

The Special Prize Contest Department which deals with small boats.

We suggest

That you make sure of getting your future copies of MoToR BOATING regularly and on time by sending in your subscription at once.

Your signature—please—gentlemen! Send no money.

SPECIAL INVITATION to the YOUNGER GENERATION of BOATMEN

IN your neighborhood, we want to appoint a special representative. It will require only a little spare time to act for us, and in return we will be glad to present you with a spyglass, fishing-tackle box, fishing rod, wood reel, double multiplying reel, cameras, flashlights, black rubber reefer, pocket compass, complete fishing outfit, etc. For full particulars, address

Present Department
MoToR BoatinG
119 West 40th Street
New York City

C. F. Chapman, Editor
MoToR BoatinG, 119 West 40th St., New York, N. Y.

Dear Sir:—

In order that I may not miss any of the Correspondence Course, the Wm. J. Deed Boat Plans, Mr. Loomis' Cruise Stories and the many other features you have planned, please enter my subscription for MoToR BoatinG for one year commencing with the August issue.

(a) Enclosed find remittance for $3.00.
(b) Send me bill for $3.00 when the subscription commences.

Name.....

Address.....

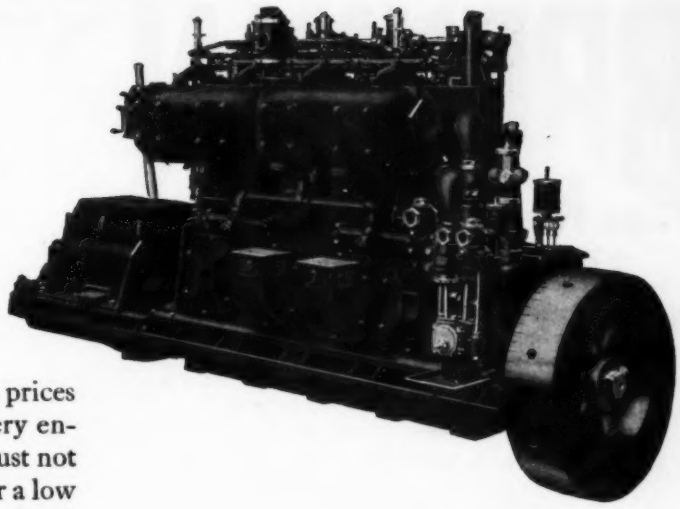
City.....

Advertising Index will be found on page 118

DODGE

Heavy Oil Engines

are operating daily on both coasts



Fuel economy with the present high prices is the most important factor for every engine owner. Economy, however, must not alone include the use of cheap fuel or a low lubricating cost but must include rugged parts, thick cylinder walls, powerful connecting rods and crank shafts to provide against break-downs, loss of time and repair bills. Dodge low speed engines with their carefully finished parts provide for the above extremely important construction.

Built by Dodge and guaranteed by Dodge to deliver full rated horse power at full speed with a tremendous saving in fuel cost, for years of steady use.

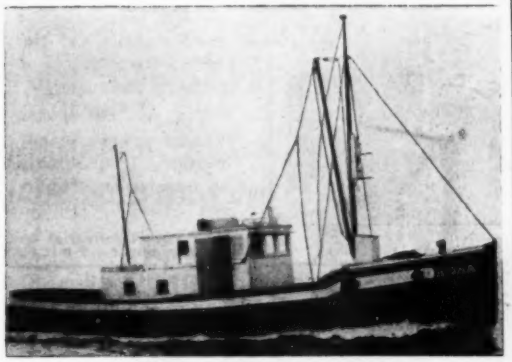
Dodge Heavy Oil Engines will run just as well at partial load or no load as they will at full load.

No water injection to the cylinder and no compressed air for the fuel injection.

Continuous low cost power from any free flowing fuel oil of 28° Baume or over.

Dodge Engines effect reduction in insurance because no gasoline is used in any way.

Fishing Boat "Bandeirante" Propelled by 50 H. P. Dodge Heavy Oil Engine



Tug "Hioma" with 37½ H. P. Dodge Heavy Oil Engine Installed

Let us send you records of test runs of boats using Dodge Heavy Oil Engines

Dodge Sales and Engineering Company

Mishawaka, Indiana, U. S. A.

BRENNAN MOTORS

20% REDUCTION

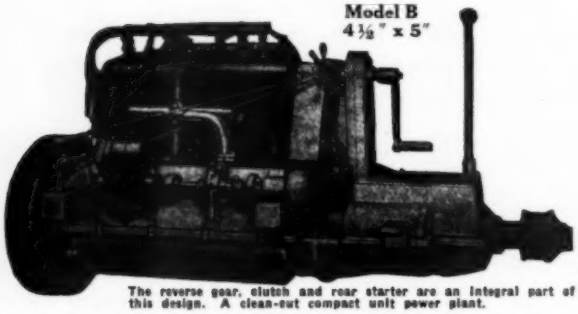
A BIG cut in price, but no cut in quality or service. It's our contribution to the new price levels everyone is looking for.

Now you can have a brand new Brennan Motor and **enjoy it this season.** Immediate shipments.

Write today for complete catalog and new prices

BRENNAN MOTOR MFG. CO.
SYRACUSE, N. Y., U. S. A.
Cable address "Binot"

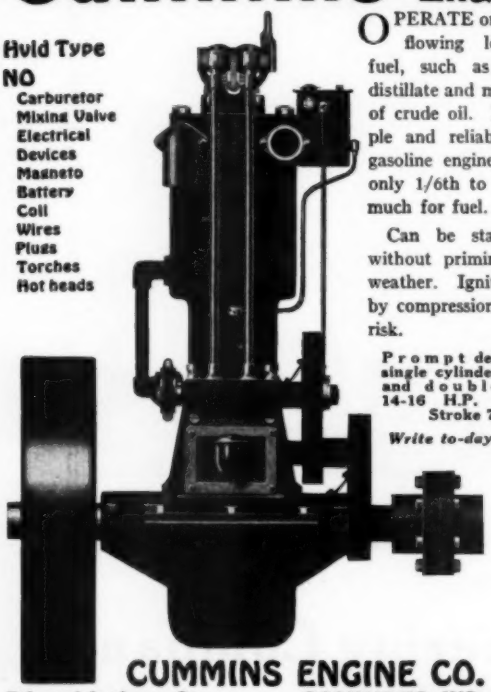
Model B
4½" x 5"



The reverse gear, clutch and rear starter are an integral part of this design. A clean-cut compact unit power plant.

Cummins Oil Engines

Hvid Type
NO
Carburetor
Mixing Valve
Electrical
Devices
Magneto
Battery
Coil
Wires
Plugs
Torches
Hot heads



OPERATE on any free-flowing low grade fuel, such as kerosene, distillate and most grades of crude oil. More simple and reliable than a gasoline engine and cost only 1/6th to 1/10th as much for fuel.

Can be started cold without priming in any weather. Ignition solely by compression. No fire risk.

Prompt deliveries on single cylinder, 7-8 H.P., and double cylinder 14-16 H.P. Bore 5", Stroke 7½".

Write to-day for prices

CUMMINS ENGINE CO.
7th and Jackson Sts. COLUMBUS, IND., U. S. A.

Correspondence Course Attracts Attention

(*Continued from page* 86)

should be made by the owner of the boat to the Collector of Customs of his district (see Table IA), preferably by mail, for a printed numbering form which will be supplied on request. Two copies of this card should then be filled in and returned by the owner to the Collector of Customs. The information required will be the name and address of the owner, type of boat; that is, cruiser, open boat, houseboat, etc., length, beam, and horsepower of the engine and the particular occupation of the vessel, whether it is used for pleasure purposes, fishing, carrying passengers for hire or whatever it may be.

After these cards have been returned to the Collector of Customs by mail or otherwise, the Collector will assign a number to the boat in conformity with the system adopted by the Department of Commerce to distinguish between the various Customs Districts. This will consist of a key letter and a serial number. An important reason for adopting this method was to keep down the size of the number so as not to exceed four figures in addition to the key letter.

The Collector of Customs will notify each owner of the number assigned to him and this must then be painted on either bow of his boat or else attached by metal or wooden numerals instead. The requirements are that they be so attached and of such a color as to be distinctly visible and legible. Once a number has been assigned to a boat it remains with the boat forever. Changes of ownership in the boat do not affect the number. It remains the same whatsoever happens to the boat. Should it be destroyed or lost or should the ownership change, then the collector must be notified within ten days of such loss.

The penalty imposed for violation of this act shall be $10 for which the vessel may be seized and proceeded against wherever found.

Not all vessels come within the provisions of the numbering act. For example, there are vessels registered, enrolled, licensed or documented in the Custom Houses; these with public vessels are not required to be numbered.

A little definition of the meaning of these various terms will prove useful. Registered vessels are those which are engaged in trade with foreign countries, the enrolled boats are those commercial boats doing business only in this country and of over 20 tons gross, and the licensed boats are those doing business in this country of less than 20 tons, but over 5 tons. Motor boats of any kind under 5 tons need not be documented. Should the vessel not be engaged in trade, she must be documented if she is of 16 tons or over or over 65 feet in length.

Pleasure motor boats requiring to be documented are those of over 16 tons gross or over 65 feet in length. They are documented by the Collector of Customs at any of the ports mentioned in Table IA.

Table IA

The key letters for the various Customs Districts and points where numbers should be applied for and are issued are as follows:

Port	Letters Assigned	Port	Letters Assigned
Portland, Me.	AB	Louisville, Ky.	L
Boston, Mass.	CDE	Pittsburgh, Pa.	V
Providence, R. I.	FG	Indianapolis, Ind.	K
Bridgeport, Conn.	HJ	St. Louis, Mo.	X
New York, N. Y.	*K	Des Moines, Ia.	H
Philadelphia, Pa.	LM	Omaha, Neb.	Y
Baltimore, Md.	NP	St. Paul, Minn.	Z
Norfolk, Va.	RS	Pembina, N. D.	J
Wilmington, N. C.	T	Great Kills, Mont.	G
Charleston, S. C.	U	Cleveland, Ohio	N
Savannah, Ga.	U	Detroit, Mich.	PR
Tampa, Fla.	VW	Chicago, Ill.	ST
St. Albans, Vt.	X	Milwaukee, Wis.	W
Ogdensburg, N. Y.	Y	Duluth, Minn.	U
Rochester, N. Y.	Q	Los Angeles, Cal.	A
Buffalo, N. Y.	Z	San Francisco, Cal.	BCDEF
Mobile, Ala.	A	Portland, Ore.	GHI
New Orleans, La.	BC	Seattle, Wash.	KLM
Port Arthur, Tex.	D	San Juan, Porto Rico	FG
San Antonio, Tex.	F	Honolulu, Hawaii	XY
Memphis, Tenn.	M	Juneau, Alaska	XY

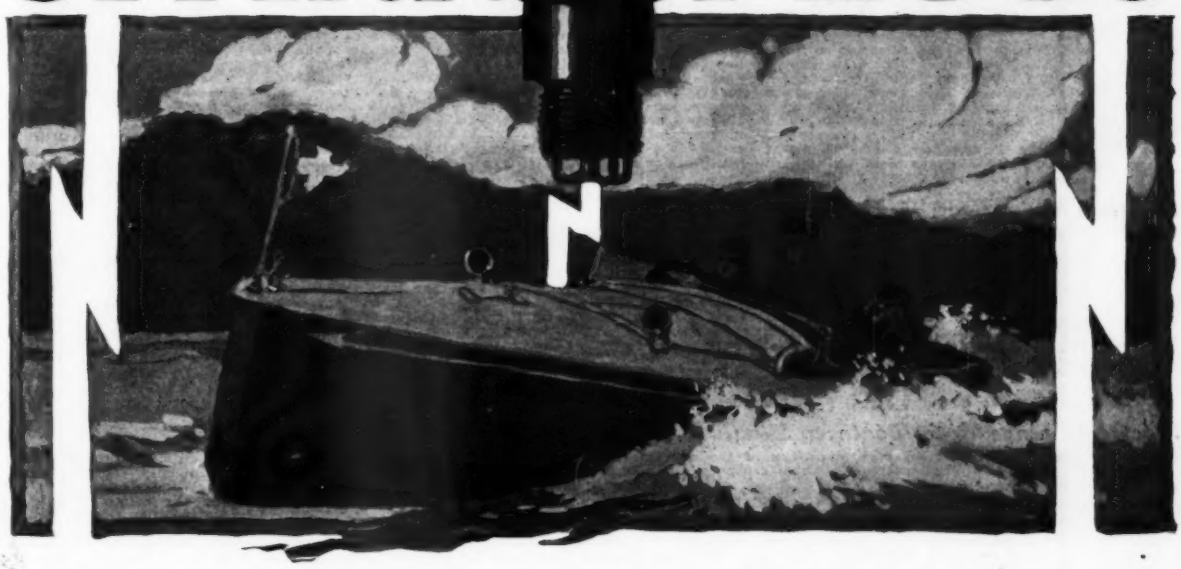
*Numbers will be awarded up to 9,999 without a letter. Additional numbers, if required, will be used in connection with the letter K.

All motor vessels of above 15 gross tons carrying freight or passengers for hire, propelled by gas, naphtha or electric motors are required to carry licensed engineers and pilots. A pleasure motor boat of either less or more than 65 feet in length or over 16 tons gross, propelled by machinery, is not under the necessity of carrying a licensed pilot and engineer on the boat.

(*Continued on page* 94)

Advertising Index will be found on page 118

BOSCH SPARK PLUGS



MAKE DEPENDABILITY POSITIVE

A little foresight, a little insistence and one of the biggest elements of chance for trouble in motor boating is reduced to a minimum. Insist on Bosch Spark Plugs, see that you get them installed and then you'll know that, as far as your spark plugs are concerned, you have the best and most dependable manufactured. "The Bosch Spark Plug is as good as the Bosch Magneto" is a large statement but a proven one. The famous Bosch features–efficiency and dependability–are built in the Bosch Spark Plug. Bosch Spark Plugs will make your motor boat a better motor boat and your summer a better summer.

Specify Bosch and get what you ask for.

400 Service Stations in 400 Centers.

AMERICAN BOSCH MAGNETO CORPORATION

Main Office and Works: SPRINGFIELD, MASS.

Branches: NEW YORK . CHICAGO . DETROIT . SAN FRANCISCO

Trade Mark

MOTOR BOATING PRACTICAL HAND-BOOKS

Every motor boatman has long felt the need for a really complete and comprehensive library devoted to their favorite pastime—motor boating. One of the obstacles to the accomplishment of this important work was the difficulty in finding any one writer who could cover the field in its entirety. In presenting the new series of practical hand-books, MoToR BoatinG believes that the problem has been solved at last. These books are edited by Charles F. Chapman, M. E., the editor of MoToR BoatinG, and they are the results of months of untiring effort on his part, together with the best of thousands of suggestions sent to him by motor boatmen themselves. The list of the contents given below will give you some idea of the vast amount of ground covered by these volumes.

Practical Motor Boats and Their Equipment

Volume 1.—The first volume tells you what the ideal boat for various kinds of service should be and what to look for in buying a boat. Many suggestions about decoration and hints on all kinds of equipment. All about steering gears, wireless outfits, electrical attachments, etc. Glance over the list of contents appended herewith: Hulls, Ballast and Seaworthiness; Round Bottom *vs.* Sharp Bilge; What are the Advantages of Flare? Raised Deck *vs.* Trunk Cabin; Best Proportion of Beam to Length; Selecting a New Design; The Advantages of Bilge Keels; Open or Solid Deadwood? What Makes a Hull Seaworthy? The $1,000 Cruiser; Buying a Second-Hand Boat; Types of Bows and Sterns; Exterior Arrangement of Cruisers; The Best Cabin Arrangement; Finishing Up the Cabin; Changes in Interior Arrangement; Interior Arrangement for Open Boat; Propeller-Rudder Arrangements; Best Position for the Rudder; Advantages of the Outboard Rudder; Different Steering Positions; Steering Equipments for Motor Boats; Steering Gear for the Cruiser; The Steering Gear for a Runabout; Steering the Boat from the Side; The Electrical Equipment; Making and Wiring a Switchboard; Electric Lighting on a Motor Boat; The Inexpensive Lighting Outfit; Wiring the Small Cruiser; The Storage Battery; The Dynamo Cut-Out; Wireless for a Small Cruiser; Tender for a Thirty-foot Cruiser; Building a Folding Dinghy; Installing the Boat Boom; What is the Best Galley Arrangement; Ventilating the Galley; The Galley Stove and Its Installation; Making a Fireless Cooker; A Portable Cook Box; Running Water for the Cruiser; How to Build a Portable Table; A Table for the Open Boat.

Practical Motor Boat Building

Volume 2.—As its title implies, this volume takes up the building of your own boat. It also covers the construction of the necessary fittings such as awning, windshield, etc. Every boatman sometime or other builds a boat, and a book of this kind will save much time and prevent many mistakes. List of contents: Types of Motor Boat Fastenings; Boat Building Woods; Laying Down a Boat's Lines; Converting a Trunk-Cabin Cruiser; A Steam Box for Amateur Builders; Joiner Between Stem and Keel; Fastening the Frames and Floors; Boring the Forgotten Limbers; Fitting the Garboard Plank; Boring the Shaftlog; Fitting the Stuffing Box; The Stern Bearings for a Cruiser; A Water-Tight Companionway; How to Canvas a Deck; Hinged Water-Tight Hatches; Making a Water-Tight Hatch; The Coaming of an Open Boat; Fitting a Swinging Port Light; Making a Self-Bailing Cockpit; A Water-Tight Window Sash; Making a Water-Tight Skylight; How to Build an Engine Housing; How to Make an Engine Cover; Building a Tool Locker; Constructing an Extension Transom; How to Make a Pipe Berth; An Ice-Box for a Cruiser; Installing a Toilet; How to Rig a Signal Mast; How to Make a Spray Hood; Fitting a Folding Windshield; An Awning for the Open Boat; A Cover for the Open Cockpit; Screens for the Side Light; A Support for the After Light; A Seat for the Man at the Wheel; Removable Davits for the Cruiser; The Boarding Steps; A Bow Rudder for Your Hydro; The Motor-Driven Club Tender.

Practical Things Motor Boatmen Should Know

Volume 3.—Navigation is one of the important subjects covered in volume three of the series. Tells you how to steer, how to increase the factor of safety, and a host of other things relative to the proper running of your boat. The chart and compass are both fully explained in a clear and comprehensive manner. The list of contents will tell you more about it; Advice for the Beginner; Lessons Learned from Experience; Good Things to Know; Increasing the Factor of Safety; Which Way Should the Boat Steer? Why a Boat Steers Badly; Why do Boats Squat? Figuring the Boat's Speed; Ballasting the Cruiser; Getting Off Bottom; To Ride Out a Storm in a Motor Boat; The Why and How of Storm Oil; Preventing Fire; Handling Ground Tackle; Government Charts; Stowing the Anchor on a Cruiser; Diminishing Deviation; Preventing Electrolysis; Stowing and Using Charts; How to Make a Chart Case; Keeping a Motor Boat's Log; How to Make a Sextant; Tides and Tidal Waters; Taking Her Through the Canals; The Best All Round Dinghy; Towing the Tender; Handling the Dory in a Seaway; Getting the Tender Aboard; Planning for a Cruise; Equipping for a Cruise; Equipment for Offshore Cruising; Novel Events for Regatta Day; Handicapping; The Object of a Handicap Rule; Laying Off a Race Course; Measuring the Length of a Race Course; Preparing a Boat's Bottom for a Race; How to Build a Turning Buoy; Starting Boats in a Race; Stowing the Signal Flags; Fitting a Gun Mount; A Fish Box for Your Cruiser; A Cabin Wall Rack.

Practical Marine Motors

Volume 4.—All about the marine motor; what it should and should not be. Tells why the automobile engine is unsuccessful in marine work. The best location for your engine, the ideal engine bed, the fuel tank, exhaust and countless other suggestions that will enable you to get the best results from your power plant. List of contents: Purchasing a Marine Motor; How Many Cylinders? Power per Cylinder; High Speed *vs.* Heavy Duty; Long Stroke *vs.* Short Stroke; Correct Motor Design; Changes in One's Power Plant; The Things that Cause Vibration; The Automobile Engine for a Boat; The Best Position for the Motor; The Ideal Engine Compartment; Placing the Engine in the Hull; Installing a Motor in a Canoe; Installing Power in a Yawl; Converting a "Banker" to Power Engine Installation in a Hydroplane; Putting Power in the Rowboat; Limits of Shaft Inclination; Constructing the Engine Bed; Getting the Motor Aboard; Lining Up the Propeller Shaft; The Best Exhaust; Mufflers *vs.* Under-Water Exhausts; Installing an Under-Water Exhaust; Primary Batteries for Ignition; Keeping the Ignition System Dry; Installing a High-Tension Magneto; From Make and Break to Jump Spark; Installing the Gasoline Tanks; Taking Care of Extra Gasoline; Spark and Throttle Controls; Constructing a Rear Starter; Propeller for Engine and Hull; Installing a Universal Joint; Gearing Motor to Propeller Shaft; The Automobile Throttle; Harnessing the Main Engine; Rebabbitting a Worn Bearing; Should Fuel Line be Inside or Outside.

Practical Motor Operation and Maintenance

Volume 5.—One of the most valuable books of the entire set. Your motor's ills and how to cure them. This volume tells you how to adjust your carburetor, how to fit piston rings, how to remedy poor compression and a number of other things that will enable you to doctor your own motor. List of contents: Locating the Motor's Troubles; The Overheated Motor; Starting in Cold Weather; Overhauling a Marine Motor; How to Save Fuel; The Fuel Situation; Using Low Grade Fuel; How to Run on Kerosene; Supplying the Fuel to the Carburetor; Adjusting the Carburetor; Cleaning the Fuel Tanks; Cleaning the Gasoline Line; Stopping Up the Leak in the Tank; A Home-Made Gasoline Gauge; Carrying an Extra Supply of Oil; Mixing the Fuel and Lubricant; Remedying Leaky Compression; Killing the Carbon Jinx; Tool and Spare Parts to Carry; Removing and Replacing Piston Rings; Repairing a Leaky Cylinder; Grinding a Motor's Valves; Setting the Valves; Timing the Ignition System; Cleaning the Water Jacket; Making and Fitting a Gasket; Patching Up a Bearing; Straightening the Sprung Shaft; Truing a Bent Propeller; Removing the Flywheel; Separating Couplings and Pipe Fittings; Changing the Shaft Hole Location; Utilizing the Exhaust; Disposing of the Bilge Water; Heating a Small Cruiser's Cabin; Operating the Outboard Motor; The Clean and Quiet Boat; Charging a Storage Battery; When the Motor Stops Unexpectedly; Making a Unit Power Plant.

Practical Suggestions for Handling, Fitting Out and Caring for the Boat

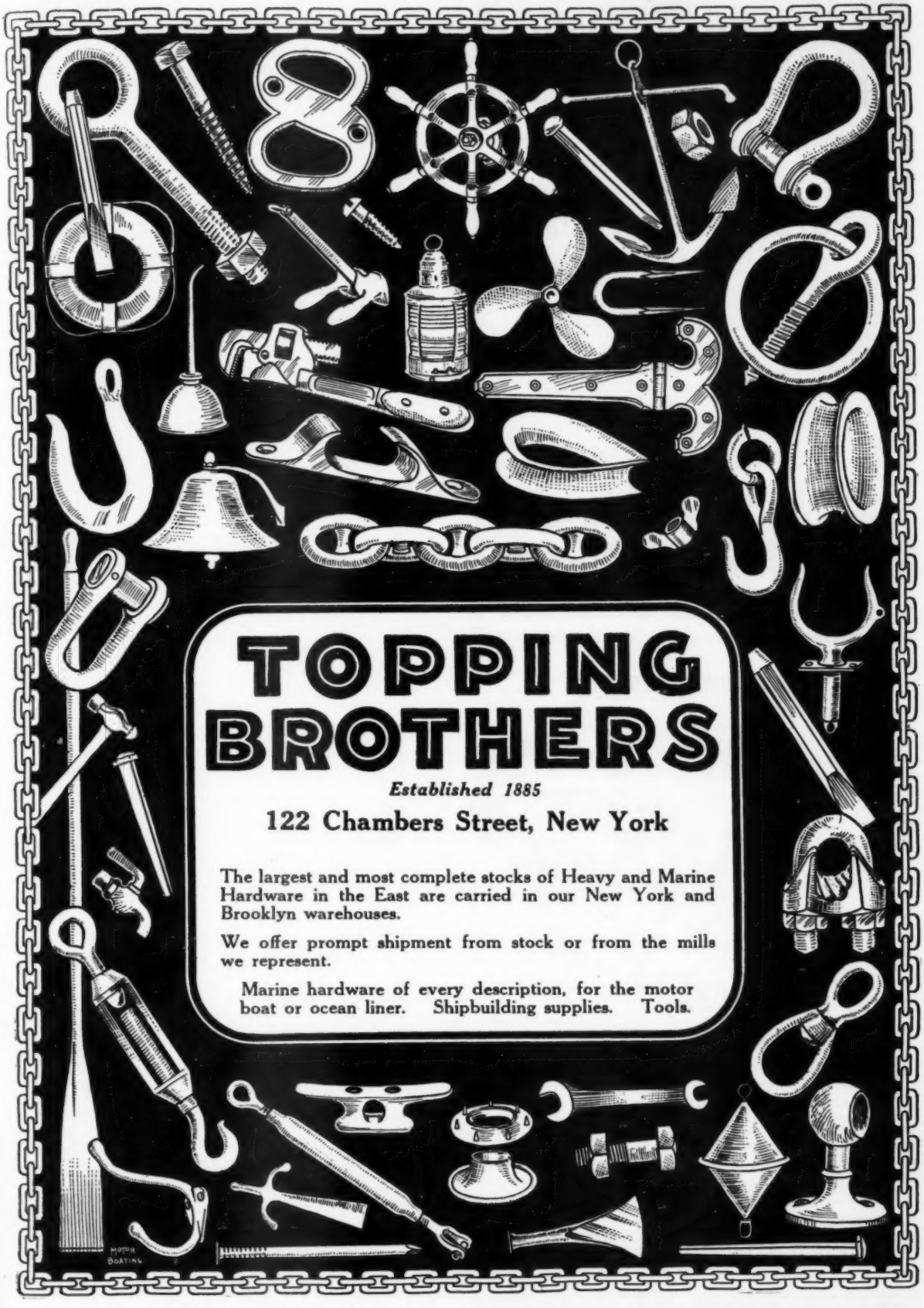
Volume 6.—This volume is an especially valuable one. You will find in it points covering the care of your boat that you never dreamed of before. Whether you are a beginner or a finished expert this book will give you a better knowledge of the handling of your craft than you can imagine. List of contents: Putting the Boat into Commission; Fitting Out a Thirty-Footer; Suggestions for the Beginner; Refinishing Bright Work; Keeping the Wood Surface Bright; Putting the Boat Out of Commission; Laying Up an Unsheltered Boat; Hauling Out for the Winter; Covering the Boat for the Winter; Launching from a Wharf; Correcting Faults; Lengthening Out the Boat; Moorings and Buoys; Taking Steps to Safeguard the Anchor; What to Use in the Bilge; Preserving the Wood in Boats; Emergency Rigs for the Cruiser; Auxiliary Sails for the Cruiser; Providing an Emergency Rudder; Preparing for Southern Waters; Stopping the Troublesome Leak; Replacing a Broken Plank; Removing Broken Lag Screws; Raising the Boat's Stern; Clearing the Propeller; Protecting the Bow and Stern; Open Boat Sleeping Quarters; Ventilating the Cabin of Small Cruisers; Converting the Open Boat to a Cruiser; Making a Cover for the Open Boat; Preventing Electrolysis; Building a Club Float; A Floating Boathouse; Constructing a Landing Stage; Building the Marine; Keeping the Thief Out; A Place for Your Shore Clothes; Stowing for Life Preservers; The Winter's Alterations; What Changes Shall I Make; The Satisfactory Bilge Pump; The Pressure Water System; Making a Pelorus; Your Storm Curtains; Life-Saving Equipment; The Absent Owner's Anchor Light; Mounting the Reverse Gear.

Price $1.50 Per Volume, or $7.50 Per Set of Six Volumes of Over 1,000 Pages

The books measure 7 x 10 inches and are handsomely bound in cloth. Each volume is fully illustrated and printed in clear type on fine paper.

MoToR BoatinG **119 West 40th Street, New York**

Advertising Index will be found on page 118


TOPPING
BROTHERS
Established 1885
122 Chambers Street, New York
The largest and most complete stocks of Heavy and Marine Hardware in the East are carried in our New York and Brooklyn warehouses.
We offer prompt shipment from stock or from the mills we represent.
Marine hardware of every description, for the motor boat or ocean liner. Shipbuilding supplies. Tools.

YOUR Motor Boat is The "TUNNEL-KING"

YOU will choose it before all others simply because of its superiority. It will take you anywhere. You can sail the broad expanse of the Great Lakes and the swiftly-moving waters of the big rivers. You can explore the mysterious back waters of the shallow creeks. Any place where there is water enough to float a log the "TUNNEL-KING" will go—swiftly and safely. The "TUNNEL-KING" is equipped with a

PROTECTED PROPELLER

The propeller revolves in a tunnel at the stern of the boat, and is still further protected by two projecting skegs, which deflect all floating obstructions so that they cannot foul the propeller. Then there is its famous one-cylinder, one-man-control "KINGFISHER" ENGINE—the engine that goes the longest distance on the least gasoline. Your "TUNNEL-KING" seats 6 passengers—will carry more at a pinch. It is 17 feet long, 22 inches deep, 4 ft. 4 in. beam—a handsome, seaworthy cruiser that will give you the best of service in every way.

WRITE FOR FREE BOOKLET—NOW.

THE A. R. WILLIAMS MACHINERY CO., LIMITED

Dept. M. B., 64 Front St. West, Toronto

Branch Offices: Halifax, St. John, Montreal, Hamilton, Winnipeg, Vancouver.

If It's Machinery—Write "Williams"

"JASCO"
SAFETY FIRST
TANK

DID YOU EVER EXAMINE YOUR GASOLINE tank? Ever wonder whether its construction increased or minimized the possibility of a leak—a fire—an explosion—even your own safety?

Equip your boat with one of these everlasting, rivetless, "Safety First" tanks and stop worrying about explosions.

Made of the finest drawn steel—tested and proved—you can take pride in the ownership of a Jasco Tank

THERE'S A JASCO TANK MADE ESPECIALLY FOR YOUR BOAT

Write us today. *We will gladly send you descriptive literature.*

JANNEY, STEINMETZ & COMPANY

Main Office, Philadelphia New York Office, Hudson Terminal Bldg.

Correspondence Course Attracts Attention

(*Continued from page* 90)

The local board of steamboat inspectors of the various ports mentioned in Table IB issue certificates for licensed pilots and engineers. Application should be made to any of these for information relative to obtaining certificates, examinations, etc.

Table IB

Supervising and local inspection districts.

Supervising inspection districts.	Local inspection districts (ports)	Supervising inspection districts.	Local inspection districts (ports)
First	San Francisco, Cal.	Seventh	Pittsburgh, Pa.
	Honolulu, Hawaii		Cincinnati, Ohio
	Los Angeles, Cal.		Pt. Pleasant, W. Va.
	Portland, Ore.	Eighth	Detroit, Mich.
Second	New York, N. Y.		Chicago, Ill.
	Albany, N. Y.		Duluth, Minn.
	New Haven, Conn.		Grand Haven, Mich.
	Philadelphia, Pa.		Marquette, Mich.
Third	Norfolk, Va.		Milwaukee, Wis.
	Baltimore, Md.		Port Huron, Mich.
	Charleston, S. C.	Ninth	Cleveland, Ohio
	Jacksonville, Fla.		Buffalo, N. Y.
	Savannah, Ga.		Burlington, Vt.
Fourth	St. Louis, Mo.		Oswego, N. Y.
	Dubuque, Iowa		Toledo, Ohio
Fifth	Boston, Mass.	Tenth	New Orleans, La.
	Bangor, Me.		Apalachicola, Fla.
	New London, Conn.		Galveston, Tex.
	Portland, Me.		Mobile, Ala.
	Providence, R. I.		San Juan, P. R.
Sixth	Louisville, Ky.		Tampa, Fla.
	Evansville, Ind.	Eleventh	Seattle, Wash.
	Memphis, Tenn.		Juneau, Alaska
	Nashville, Tenn.		St. Michael, Alaska

The licensing of pilots and engineers for boats of over fifteen tons gross or over 65 feet in length engaged in trade should not be confused with the operator's license which is required for motor boats of under 65 feet in length or under sixteen tons carrying passengers for hire. On motor boats of this size carrying passengers for hire only an operator's license is required. This license is granted by the local steamboat inspectors without examination of any kind whatsoever other than a color blind test to determine whether the operator can distinguish between the colors of red and green. The only credentials necessary for obtaining an operator's license are three letters from reputable citizens to the local steamboat inspectors stating that the writer is acquainted with the applicant for an operator's license and knows him to be of an industrious and sober disposition.

Fishing vessels and vessels propelled by machinery not more than 65 feet in length, except tugboats propelled by steam, will not be required to carry licensed officer, except a licensed operator on such vessels carrying passengers for hire.

War Tax

All documented and undocumented motor boats not exclusively engaged in commercial pursuits pay a special war tax depending upon their size to the Collector of Internal Revenue of the district in which the owner resides. This tax is also imposed upon yachts, pleasure motor boats, and sailing boats of over five net tons, not used exclusively for trade or fishing.

Table II

These boats are exempt from the tax:

(a) If used exclusively for trade or fishing; by trade is meant carrying property and persons in trade not for pleasure, or used by owner in the conduct of his business; for fishing, is meant as a business or livelihood.
(b) If used exclusively for national defense; or
(c) If built according to plans and specifications approved by the Navy Department.

The owner, or if the boat is leased or chartered for the entire taxable period ending the next following June 30, the lessee or charterer of every boat is required to make a return, and, unless the boat is exempt from the tax, is also required to pay the tax.

Tax is payable on or before July 1 of each year and also on or before the last day of the month in which the purchase is made, in the case of original purchase of a boat. Note carefully that a return must be made annually for all boats irrespective of whether the boat is or is not taxable. In the case of original purchase of a boat at any time subsequent to July 1, the tax for the first year shall be computed for the number of calendar months, including the month of sale, remaining prior to the following July 1. In all other cases the tax shall be computed for the full period of twelve months.

Table III-A

Equipment for Pleasure Motor Boats Under 65 Feet in Length

The items of equipment which must be carried by the various classes of motor boats whenever they are under way are as follows: (*Continued on page* 98)

Advertising Index will be found on page 118

The Evinrude's Twelfth Fourth of July

ON America's countless lakes and streams, thousands of care-free Evinruders are celebrating the Fourth of July—Evinrude's twelfth.

For twelve years this husky little detachable motor has been a favorite with out-door lovers. Just the power-plant for dinghy or tender. Takes you to distant anchorage or nearby yacht club, without any tiresome oar-work. Handiest sort of equipment for fishing or hunting trip. Regardless of wind or weather, this trusty "stern-kicker" will get you there and back. And it costs but a penny a mile for "gas" and oil.

For twelve years the Evinrude has been the world's standard power-plant for watercraft, gradually developed and thoroughly perfected by a great organization. Its dependable, vibrationless power is known wherever navigable water flows.

Two Horse Power
Automatic Reverse
Built-In-Flywheel
Magneto

Ask your sporting goods or hardware dealer to show you the Evinrude. Or send for catalog

EVINRUDE MOTOR COMPANY
453 Evinrude Bldg. Milwaukee, Wis.

Distributors:

69 Cortlandt St., New York, N. Y.
780 Commonwealth Ave., Boston, Mass.
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211 Morrison St., Portland, Ore.

Service Stations:

Cor. 11th and G Sts. N. W., Washington, D. C.
1009 Capitol Ave., Houston, Texas
421 Clinton St., St. Paul, Minnesota
91 East Bay Street, Charleston, S. Carolina
9 Grand River Avenue, E. Detroit, Mich.
609-611 Market Street, Philadelphia, Pa.

EVINRUDE
DETACHABLE MOTOR FOR WATERCRAFT

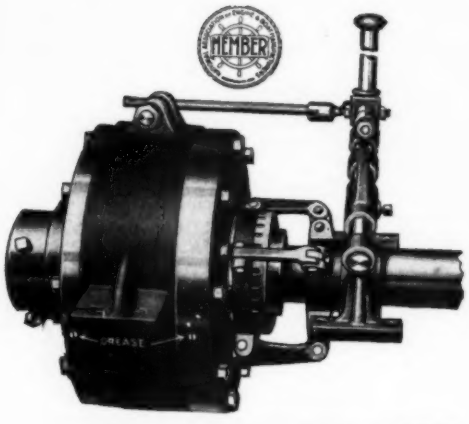
When a Good Gear and a Good Engine Get Together

(Copy of Telegram)
Detroit, Mich.
May 10. '21

"Snow & Petrelli Mfg. Co.,
New Haven, Conn.

The Smith twin six motors in Gar Junior Second were fitted with Joes Gear especially adapted to this motor when record run from Miami to New York was made and they proved entirely satisfactory."

(Signed) GAR WOOD.



In hydroplane or cruiser a powerful, reliable transmission is just as important as a powerful, reliable engine.

Ask us about the gears in Misses Detroit I, II, III and IV, Miss Minneapolis, Miss Toronto, Miss America, Gar Wood Jr. I and II. Ask Gar Wood or Dustin Farnum why they prefer Joes Gear.

It is a well known Joeism that "You can't tow the state of Maryland with a cotton yarn;" *i. e.*, get a *good* gear.

Write for catalog of Joes Gears, One-Way Clutches, Safety Rear Starters, etc.

JOES REVERSE GEAR

80%—88% Reverse Speed Ratio

THE SNOW & PETRELLI MFG. CO., 156-B Brewery St., New Haven, Conn.

Builders of High Grade Engines who assure their customers gear satisfaction by an extensive use of JOES GEARS.

Smith-Liberty 12 Cylinder
New London Ship & Engine Co.
Dodge "Burnoil" Engine Co.
Mid-West Engine Co.
Kahlenberg Bros. Co.
Clay Engine Co.
Vern Severin
Gulowsen-Grei Engine Co.
Miami Motor Works
Buffalo Gasoline Motor Co.
Gaith Motor Co.
Bridgeport Motor Co.
Camden Anchor-Rockland Machine Co.
Gray Motor Co.
Hubbard Motor Co.
Lockwood Ash Motor Co.
Mecco Engine Co.
Roberts Motor Mfg. Co.
Wright Machine Co.
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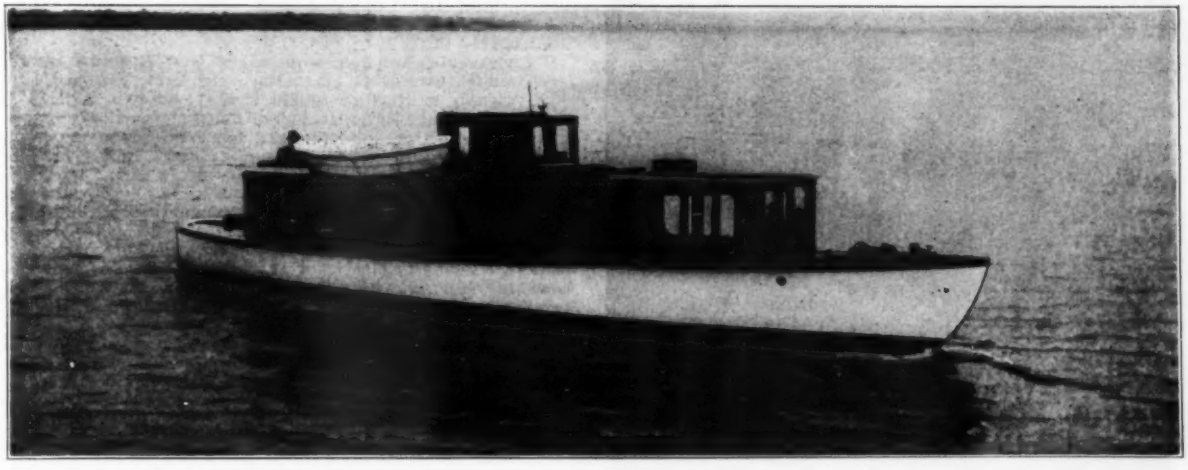
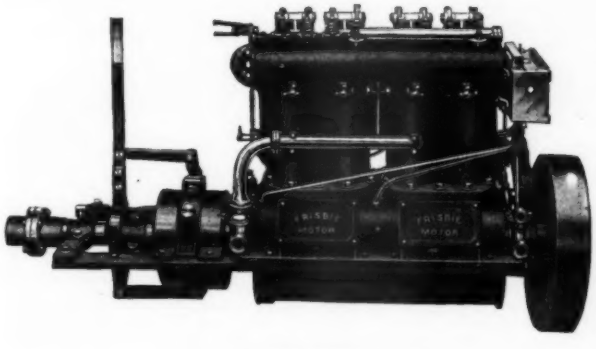
Southern Calif.—Fellows & Stewart, Inc., Wilmington.
San Francisco, Calif.—A. G. Hegben, 440 Market St.
Seattle, Wash.—Pacific Marine Engine Co.
Toronto, Canada—A. R. Williams Machinery Co.
Montreal, Canada—The Pyke Motor & Yacht Co.
Newfoundland—John Barron & Co., 241 Water St., St. Johns.
England—J. King & Co., 10 Church Row, Limehouse, E., London.
Norway—Arendahl Motor & Machine Co., Arendahl.
Turkey—Societe Generale d'Automobiles, Constantinople.

Advertising Index will be found on page 118



"Frisbie" Member of Exclusive Currituck Shooting Club



The "Friendly" Frisbie has been elected a member of the exclusive Currituck Shooting Club. . . . More, it has been given a place on the "reception committee."

In the Club's boat "Cygnet" the Frisbie meets the members at the railroad terminal at Munders Point, Virginia, and assures them of a pleasant untroubled trip to the Club House out in Currituck Sound, N. C.

The "Cygnet" is a 55-ft. tunnel stern boat designed for the Club by Mr. William Gardner of New York, and is equipped with two 4-cyl. 40 H. P. Frisbie Valve-in-Head Motors.

The Frisbie is becoming increasingly popular wherever reliable service is demanded. Catalog and name of nearest dealer on request.

Frisbie VALVE-IN-HEAD MOTOR

10 Models, 1—6 Cylinders, 5—75 H.P.; All Four Cycle

Frisbie Motor Company

7 College Street, Middletown, Conn.

Immediate delivery can be made on 5, 7 and 10 H.P. motors.

Frisbie an' I

Michigan Marine Motor

Write for Folder Today.

The ENGINE You Have Been Waiting For.

Repairs At Any Ford Garage

$135.00

STURDY—RELIABLE—ECONOMICAL

4-CYCLE—4 H. P. WEIGHT 115 LBS.

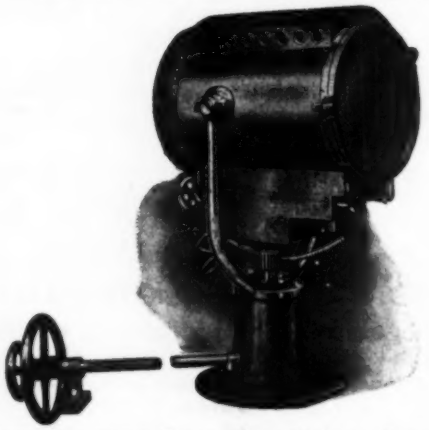
Well Worth Investigating.

—USER OR DEALER—

MICHIGAN MARINE MOTOR CORPORATION

7235 E. JEFFERSON AVE. DETROIT, MICHIGAN

CARLISLE & FINCH ELECTRIC SEARCHLIGHTS



have for years been the choice of careful motor boat and ship owners. Made in all diameters, from 7" to 60". Used on every size craft from motor boat and yacht to battleship and ocean liner.

The Carlisle & Finch catalog of searchlights will be mailed to any boat owner, builder and marine architect on request

THE CARLISLE & FINCH COMPANY

261 East Clifton Ave. Cincinnati, Ohio

Correspondence Course Attracts Attention

(*Continued from page* 94)

Class I—Boats under 25 feet, L. O. A.

Lights—Combination red and green lantern (or bow and colored side lights) and stern light.

Sound Apparatus—Whistle capable of producing blast prolonged for at least two seconds.

Class II—Boats 26-40 feet, L. O. A.

Lights—White forward light (lens at 19 square inches); white stern light; green starboard light; red port (lenses at least 16 square inches); screens at least 18 inches long; lenses, fresnel or fluted glass.

Sound Apparatus—Same as Class I, plug fog horn and bell.

Class III—Boats 40-65 feet, L. O. A.

Lights—Forward light with lens at least 31 square inches; white stern light; green starboard light; red port light (lenses at least 25 square inches); screens at least 24 inches long; lenses, fresnel or fluted glass.

All Classes—One life preserver for each person on board. Life preservers, life belts, buoyant cushions, ring buoys, or similar devices in sufficient number for every person on board, and placed so as to be readily accessible. Life preservers or buoyant cushions must be capable of keeping afloat for twenty-four hours a weight exerting a direct downward pull of twenty pounds, on boats not carrying passengers for hire. No pneumatic life-saving appliances or appliances filled with granulated cork will be permitted. Planks, grating, etc., or small boats in two cannot be substituted for required life-saving appliances. Floats of seasoned wood, not exceeding white pine in weight, and measuring at least 4 feet by 14 inches by 2 inches, may be used.

A fire extinguisher capable of extinguishing gasoline fires.

At anchor, a white light only, less than 20 feet above the hull, visible around horizon for at least one mile.

Two copies of the Pilot Rules must be carried on board.

Table III-B

Equipment for motor boats under 65 feet in length carrying passengers for hire. All equipment mentioned in Table III-A except that one regulation life preserver for each person on board must be carried.

Table III-C

Equipment for motor boats over 65 feet in length not carrying passengers for hire. One life preserver or buoyant cushion for each person on board. A fire extinguisher.

Motor boats operating on other than Federal waterways, that is, inland lakes which do not form part of the boundary line between two states or between this country and Canada, are obliged to pay the same war tax but are not required to carry the equipment required by the Federal Government (see Table III-A). Boats operating on the inland waterways are under the jurisdiction of the various state governments which make their own laws as to the required equipment.

Inspection of Hull and Machinery

The hull and machinery of every motor boat over 65 feet in length, carrying passengers for hire or for trade, must be inspected. Such other provisions of law for the better security of life as may be applicable to such vessels shall, by the regulations of the Board of Supervising Inspectors, also be required to be complied with before a certificate of inspection shall be granted; and no such vessel shall be navigated without a licensed engineer and a licensed pilot.

No motor boats of less than 65 feet in length are required to have their hulls and machinery inspected, except those motor boats of over 15 gross tons carrying freight or passengers for hire but not engaged in fishing as a regular business, are subject to inspection whether under or over 65 feet in length. Neither are any motor boats of less than 65 feet in length required to have a licensed pilot or engineer except those carrying passengers for hire which must be operated by a licensed operator and motor boats of over 15 tons gross, engaged in trade, which must have a licensed engineer and a licensed pilot.

Motor boats subject to inspection cannot be navigated unless they have certificates and have on board such complements of licensed officers and crew, including certificated life-boatmen, as may in the judgment of the local inspectors be necessary for her safe navigation.

Motor boats and motor yachts used for pleasure purposes only are not subject to inspection nor are they required to have a licensed captain, engineer or crew. This rule holds good irrespective of boat's length or size.

Name of Boat

Documented boats must have the name and home port on the stern and the name on each bow. Numbered motor boats are not required to carry a name on stern or bow, although it is recommended that they do.

Measurement

Tonnage measurement is required only on documented motor

(*Continued on page* 102)

Advertising Index will be found on page 118

Ride With Mr. Joy
in the Good Ship RAJAH

Waterproof Rajah Plug

Waterproof Shockproof Breakproof

All Threads

$1.50

A set of Waterproof Rajah Plugs in your motor will insure the utmost reliability—at least as far as the ignition is concerned.

MAKE up your mind to get the most out of your boating hours. Whether you have a little rowboat motor or a handsome cruiser you deserve uninterrupted service every moment you are on the water. And that requires good spark plugs —RAJAH Spark Plugs.

For more than twenty years RAJAH Plugs have been the best spark plugs possible to manufacture. That is a big claim but it is warranted by the service they have given, the friends they have made and kept, the records they have won. Experienced boatmen stand by Rajahs year after year because it has been found they make ***ignition absolutely sure.***

All spark plugs look about alike and cost about the same. Buy yours by name and be guided by the long standing reputation for quality which Rajah has earned.

If your dealer does not have genuine Rajah Plugs, send us his name, tell us the size you want, and we will see that you are supplied, postpaid. If you are not sure of the size, tell us the name of your engine

Standard Rajah Plug All Threads

$1.00

Rajah Terminals are used as standard equipment by most of the well known marine engine manufacturers

Thumb Nut — with all Rajah plugs unless Ball or Stud type preferred

Regular Fits any size cable

Thrust **Hook**

Furnished with ferrules to fit any size cable

Giant Rajah Plug, All Threads

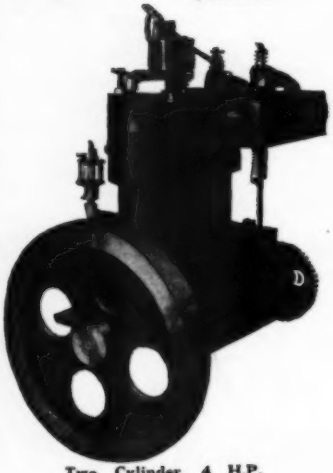
$1.25

Rajah Auto Supply Co., Bloomfield, N. J.

43084A

DUNN MOTORS

Single Cylinder, 2 H.P.
Bore 3¼", Stroke 4"
$42.50



Two Cylinder, 4 H.P.
Bore 3¾", Stroke 4"
$75.00

Two Cylinder, 8 H.P.
Bore 4¼", Stroke 5"
$125.00

The Lowest Priced Four Cycle Motors Made

Kerosene or Gasoline Fuel

IF you want a genuine four cycle motor at the lowest possible cost, don't fail to investigate the Dunn Motors. They give you the undoubted advantages of four cycle design at a cost about the same or less than ordinary two cycle motors.

The low cost of Dunn Motors is due to their simplicity of design and construction. Dunn prices speak for themselves. They are just enough to cover essential materials and workmanship. There are just so many necessary working parts in an engine, and anything beyond this means unnecessary expense for the buyer.

Hundreds of Dunn Motors are in use and it is surprising how many testimonial letters we receive from satisfied users. Many a Dunn owner says he would not change engines for others of higher price.

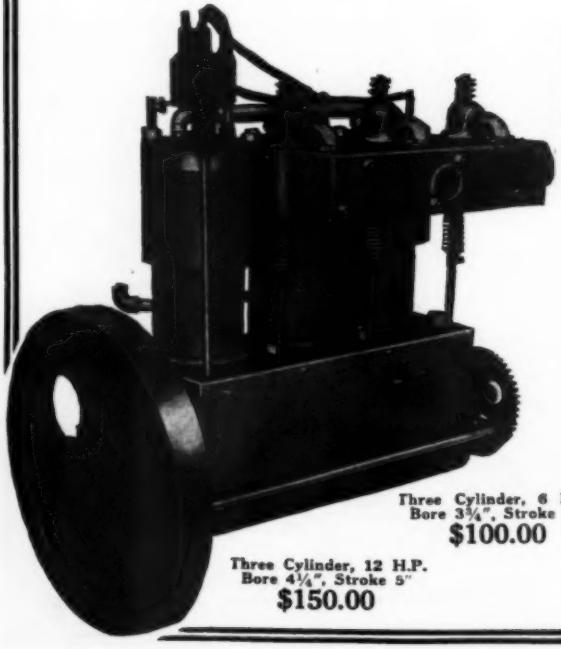
When you buy a Dunn, you don't get a fancy engine but you get one that's worth the money. We have aimed to supply a satisfactory motor for the man who doesn't care for fancy finish but wants the most power and service for his money.

The prices quoted include complete equipment, propeller, shaft, couplings, coil, spark plugs, mixing valves and oil cups. Foreign buyers should add 10% to cover cost of boxing for export and delivery F.O.B. steamer at New York City.

Write today for catalog

DUNN MOTOR WORKS

OGDENSBURG N. Y., U. S. A.



Three Cylinder, 6 H.P.
Bore 3¾", Stroke 4"
$100.00

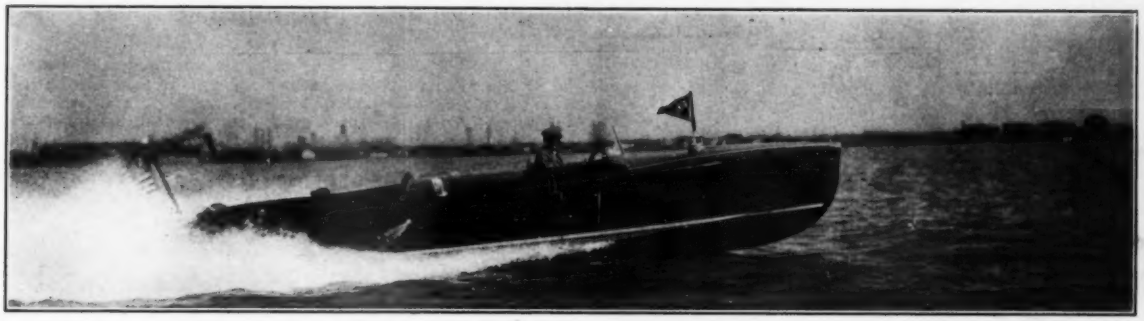
Three Cylinder, 12 H.P.
Bore 4¼", Stroke 5"
$150.00

DUNN GUARANTEE

We guarantee every Dunn Motor to be run under its own power before shipment.

Four Cylinder, 16 H.P.
Bore 4¼", Stroke 5"
$175.00

Advertising Index will be found on page 118

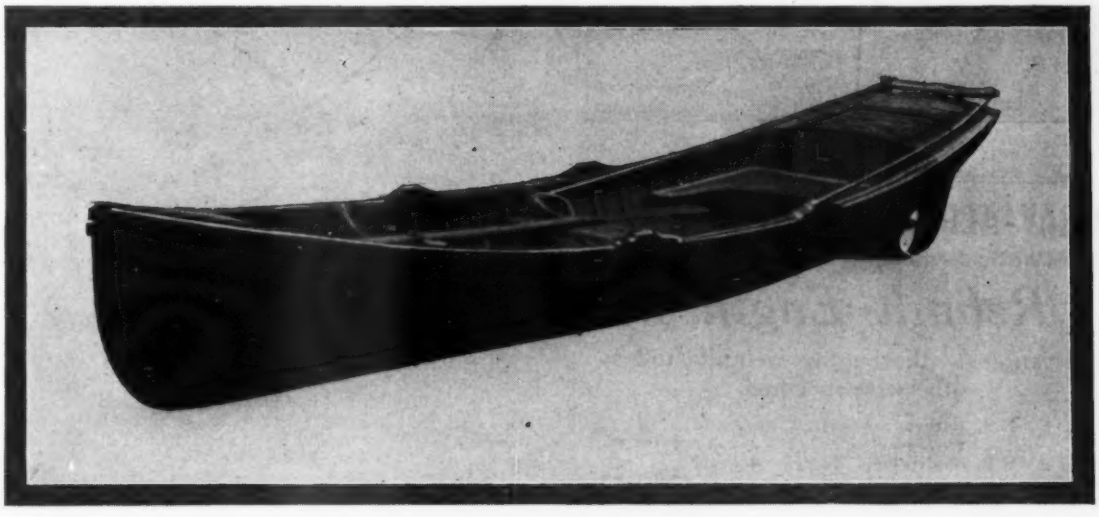


PEE JAY

The Belle Isle Bear Cats are proving the sensation of the 1921 Season. One ride will explain why. Let us send you further information.

BELLE ISLE BOAT & ENGINE COMPANY

9662 E. Jefferson Ave. **Detroit, Mich.**



THE MOTO-ROW

This combination motor and rowboat has a 2 HP Gierholt, one cylinder motor installed under the rear seat. By lifting the folding hatch the entire plant including batteries and gasoline tank become readily accessible. Four persons can ride comfortably and its speed averages seven miles per hour. Built in two sizes.

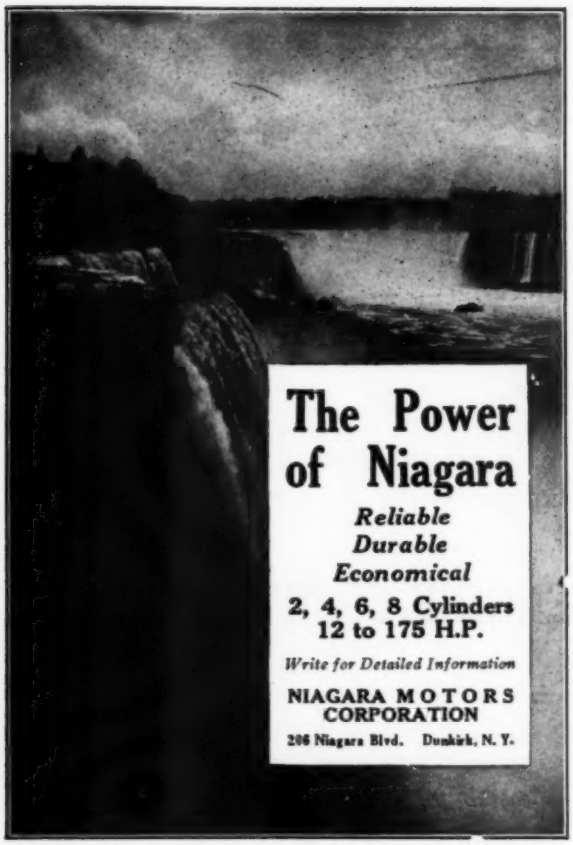
16 Foot at $275.00 **18 Foot at $300.00**

Dealers Correspondence Solicited

BELLE ISLE BOAT & ENGINE COMPANY

Motor Boat Lane

9662 E. Jefferson Ave. **Detroit, Michigan**



GRAY-ALDRICH COMPANY, Inc.
84 Atlantic Avenue **Boston, Mass.**

Rebuilt Engines

All engines thoroughly rebuilt unless otherwise specified.

255	36 H.P.	Lathrop, 3 cyl. 2 cyc. and rev. gear	$700.00
275	80 H.P.	Wolverine, 3 cyl. 4 cyc. prop. and rev. gear	2500.00
277	16 H.P.	Lathrop, 2 cyl. 2 cyc.	285.00
287	24 H.P.	Lathrop, 2 cyl. 2 cyc. and rev. gear	425.00
292	5 H.P.	Lathrop, 1 cyl. 2 cyc. overhauled	65.00
299	24 H.P.	Lathrop, 2 cyl. 2 cyc. no rev. gear	350.00
300	3 H.P.	Faultless Seine Purser, 2 winch heads	135.00
302	5 H.P.	Wolverine with rev. gear	175.00
303	16 H.P.	Lathrop, 2 cyl. 2 cyc. with coupling and prop.	310.00
307	16 H.P.	Lathrop, 2 cyl. 2 cyc.	267.00
312	20 H.P.	Lathrop, 2 cyl. 2 cyc.	380.00
320	215 H.P.	Van Blerck, Model J-8 cyl. Elect. Starter	1850.00
329	24 H.P.	Lamb, 4 cyl. 4 cyc. with rev. gear	600.00
330	90 H.P.	Buffalo, Model "Q" high speed, rev. gear and mag.	1000.00
331		Paragon Reverse Gear, Model "C"	75.00

TRENHOLM FUEL VAPORIZERS for using kerosene fuel on four cycle engines. Vaporizer circular on request.

Correspondence Course Attracts Attention

(*Continued from page* 98)

boats, which includes registered, licensed and enrolled boats.

Documented boats engaged in trade of less than 15 tons gross are not subject to hull and machinery inspection, neither are they required to carry a licensed crew. Documented boats of sixteen tons or over engaged in trade or carrying passengers for hire are subject to hull and machinery inspection and must carry a licensed crew. Documented motor boats and yachts not engaged in trade or not carrying passengers for hire are not subject to hull or machinery inspection and are not required to carry licensed officers or crew.

SALES AGENCIES FOR GOVERNMENT PUBLICATIONS

The price of the Light Lists of the Atlantic and Gulf Coast, of the Pacific Coast and of the Great Lakes is 30 cents each; of the Light Lists of the river districts (covering the Mississippi River and tributaries), 20 cents each; and of the Buoy Lists of the several lighthouse districts, 20 cents each. Chart catalogues published by the Coast and Geodetic Survey are distributed free by agents handling Coast and Geodetic Survey publications and at the Coast Survey field stations.

In addition to the agencies listed below which handle Buoy Lists, Light Lists, Charts, Coast Pilots, Tide Tables and Chart Catalogues there are many other agencies handling a partial list of these publications in the same and other cities. Write to the Division of Publications, Department of Commerce, Washington, D. C., for a list of such agencies.

Maine—Bath: Charles Harriman. Boothbay Harbor: R. G. Hodgdon. Camden: The Village Shop. Portland: Wm. Senter & Co. Rockland: Huston-Tuttle Book Co.
Massachusetts—Boston: Coast and Geodetic Survey Field Station, 1806 Custom House; W. E. Hadlock & Co. Gloucester: George H. Bibber. New Bedford: Briggs & Beckman. Vineyard Haven: E. R. Tilton.
Rhode Island—Block Island: C. C. Ball.
Connecticut—New London: Edwin Keeney Co.; The Darrow & Comstock Co.
New York—Albany: B. Lodge & Co. Greenport: George B. Preston. Huntington: Huntington Hardware Co. New York: John Bliss & Co.; Coast and Geodetic Survey Field Station, 503 Custom House; Rand, McNally & Co.; Michael Rupp & Co. Northport; Charles S. Mott.
Delaware—Wilmington: David A. Hay & Co.
Pennsylvania—Philadelphia: John E. Hand & Sons Co.; Riggs & Bros.
Maryland—Baltimore: John E. Hand & Sons Co.
Virginia—Newport News: W. L. Shumate & Co.
Florida—Apalachicola: J. E. Grady & Co., Water St. Jacksonville: The H. & W. B. Drew Co. Miami: Frank T. Budge, Pensacola: McKenzie Oerting & Co.
Louisiana—New Orleans: Coast and Geodetic Survey Field Station, 314 Custom House; J. S. Sareussen; Woodward, Wright & Co.
Canal Zone—Cristobal: Captain of the port.
California—Long Beach: J. G. Spielman. San Diego: Arey-Jones Co. San Francisco: Coast and Geodetic Survey Field Station, 310 Custom House; Geo. E. Butler, Alaska Commercial Building; A. Lietz Co.; Louis Weule Co. San Pedro: Marine Hardware Co. and J. C. Rudbach, Inc.
Oregon—Portland: The Beebe Co.
Washington—Anacortes: S. D. Temple & Co. Bellingham: Edward T. Mathes. Olympia: Seattle: Coast and Geodetic Survey Field Station, 202 Burke Building; Lowman & Hanford Co.; Max Humer Co.; Pacific Net & Twine Co. Tacoma: M. R. Martin & Co., Inc.

QUESTIONS FOR CORRESPONDENCE COURSE

Lesson No. 5

(Published in June MoToR BoatinG)

The Legal Requirements for All Classes of Boats—Government Publications. Answers should be sent to the Editor of MoToR BoatinG, 119 West 40th Street, New York

Note: Before answering the questions for Lesson No. 5 be sure to read all the text on this page as there is considerable supplementary data on Lesson No. 5:

1. What length motor boats fall into Class 1?
2. What length boats fall in Class 2?
3. What length boats fall into Class 3?
4. What Government equipment is to be carried on the boats of Class 1?
5. What additional Government equipment is required on boats of Class 2?
6. In what respects does the equipment required on boats of Class No. 3 differ from that on Class No. 2?
7. What additional or different equipment must be carried on motor boats of not more than 65 feet in length carrying passengers for hire?
8. To whom does one desiring to obtain a license to operate a boat carrying pasengers for hire make application?
9. What credentials, letters or statement of qualifications must the applicant (Question No. 8) present?
10. Is an examination required to obtain a license to operate a motor boat carrying passengers for hire?
11. Is a test for color blindness required?
12. Will an ordinary mouth whistle pass Government inspection as the whistle required on a motor boat?
13. Will the various forms of electric horns pass Government requirements for the whistle specified for motor boats?
14. Will a buoyant cushion pass as a life preserver on motor boats not carrying passengers for hire?
15. Will a buoyant cushion pass as a life preserver on boats carrying passengers for hire?
16. What may be substituted for life preservers, buoyant cushions, etc., on motor boats not carrying passengers for hire?
17. Does a dinghy pass as life-saving equipment?
18. Will fog horns pass Government requirements for the whistle specified for motor boats?

(*Continued on page* 104)

Advertising Index will be found on page 118

Hacker-Craft

The Latest Hacker Wonder Boat

This double cockpit 28-foot wonder boat is the latest work of John L. Hacker, who claims it his greatest achievement in his experience as a naval architect. Five passengers can ride in perfect comfort, free from all noise, dirt, and spray, and the sensation is such that cannot be had in any other type of boat.

This outfit is powered with a four-cylinder Hall-Scott motor, which drives it smoothly, at a speed of over 30 miles per hour. It is a solid mahogany job throughout. Has high well upholstered backs, allowing the maximum of comfort. Has full controls in forward cockpit and is a first class fully equipped outfit in every way. We can make *good delivery on the next job.* Full particulars will be sent interested parties upon request.

For Immediate Delivery

One 28′6″ Double Cockpit type, same as described above. This is unquestionably the best ever produced in that type of boat. Will not last long.

One 29′3″ Solid Mahogany hull, complete ready for motor. Built for 4 or 6 cylinder Hall-Scott Motor. Will make an attractive price on hull only or complete. Nothing better ever built, and a perfect performer.

One Special Solid Mahogany 21 Footer. Powered with a Kermath Special. The best 21 footer ever built. Will make a special price for quick turnover.

DOUGHBOY—35-foot, double cockpit. Forward controls. Solid Mahogany. Six cyl. Hall-Scott Motor. Will do over 35 miles at any time, will carry ten passengers. In perfect condition. Will demonstrate Detroit any time. Owner is getting larger boat. Price for quick sale $6500

LAURA-B—30-foot solid Mahogany, double cockpit type. Powered with FS four cyl. Sterling. Speed up to 30 miles. A fine performer, and in perfect condition. Demonstrate Detroit. For quick sale $5000

We will figure on any high class proposition in a high speed outfit. Quality, performance, and speed guaranteed.

HACKER BOAT CO.

Shops: Detroit & Mt. Clemens, Mich. **Office: 1525 Crane Ave., Detroit**

FOR SALE

FORMER LOZIER MARINE ENGINE PLANT
(75 x 250 feet)

PLATTSBURGH, N. Y.

Deep Water Lake Front
R. R. Siding Through Building
Barge Canal Terminal Alongside
Excellent Skilled American Labor
Building Sound and Tight—Electric Power—Heating Plant—Forge—Traveling Crane Through Building—Two Small Cranes

80% equipped with machinery designed for making Marine Motors or similar machinery. Ample land for all purposes.

Price for Land, Building, Machinery - $30,000.00

Representing one-quarter replacement value.
ADVANTAGEOUS TERMS WILL BE MADE, ESPECIALLY WITH A-1 GOING CONCERN.

ADDRESS

WM. L. PATTISSON, Attorney
Plattsburgh, N. Y.

ROBERT L. JOHNSTONE
24 Mt. Pleasant Ave.
Newark, N. J.

Bites Instantly

The *WC* Navy Anchor takes hold at the first pull of the cable, and the harder the tug, the firmer the hold.

WC Stockless Navy Anchor

Solid wrought iron shank; free from "pin hole." Lies in holding position at angle of 55° to flukes, per Navy Specifications. One piece head; no mud gathering pockets. Tripping fin on head absolutely prevents dragging flukes up. Heavily galvanized by hot process. Proper shackle furnished. At your dealer's or write us.

Can't Foul. Won't Drag.

Get this Valuable Book

"Sea Craft Suggestions and Supplies"; over 275 pages of useful hints about Moorings, Steering Gear, Compasses, etc. Sent only for 50c.

WILCOX, CRITTENDEN & CO., Inc.
4 South Main Street **Middletown, Conn.**

Correspondence Course Attracts Attention

(*Continued from page* 102)

19. Are motor boats over 15 tons, carrying passengers for hire, subject to inspection?
20. Are motor boats under 15 tons, carrying passengers for hire, subject to inspection?
21. What Government officials have charge of the inspection of those motor boats carrying passengers for hire which are subject to inspection?
22. Are motor boats or motor yachts of any size, not carrying passengers for hire, subject to inspection?
23. Motor boats, of what size (not carrying passengers for hire) must be documented?
24. By whom are motor boats documented?
25. Must the boat's name and hailing port be painted or otherwise attached to the stern of a documented boat?
26. What Government officials or employees are authorized to make inspections of motor boats to see if all equipment is on board?
27. Is a motor boat at anchor required to have Government equipment on board?
28. Must a motor boat have been seen underway or known to have been underway by an inspector before he can board that boat for the purpose of inspecting the equipment?
29. What flags must be flown by a boat authorized to make the Government inspection for equipment?
30. Does the Government require that the owner or operator of a pleasure motor boat of any size, not carrying passengers for hire, know anything about his boat, its operation, navigation, etc.?
31. Does the Government require any of the following equipment to be carried on board: an anchor, a compass, an anchor line, a pump, a dinghy, provisions, etc.?
32. Will a pail of sand answer as a fire extinguisher?
33. From whom may copies of the Pilot Rules be obtained?
34. Are license officers required on yachts or pleasure motor boats (not carrying passengers for hire) of any size?
35. What size motor boat is required to be numbered?
36. By whom are motor boats numbered?
37. At what city would *you* obtain the number for *your* boat?
38. What types or sizes of motor boats are not required to be numbered?
39. To whom is the annual war tax on the use of motor boats paid?
40. Who gives the examinations for license officers required to be carried on documented boats other than yachts and pleasure motor boats?
41. What Government publications should be carried on any motor boat?
42. From whom do you obtain the above publications?
43. If you wish to sail from Sandy Hook to Philadelphia how would you know what charts you required, their price, and from whom to purchase them?
44. What charts (state numbers) would be required if you wished to sail from Sandy Hook to Philadelphia.
45. What buoys would you pass sailing from Portland, Maine, to Yarmouth? (This information may be obtained from the Buoy List of the First Lighthouse District.)
46. What is the Notice to Mariners? (When and by whom published? What information does it give?)
47. What time is it high water at New London, Connecticut, on the morning of July 15, 1921? (Do not omit this question—get a copy of the Government Atlantic Coast Tide Tables and learn to use it.)
48. What time is it high water at Yonkers, Hudson River, New York, on the morning of July 15, 1921?
49. If you should go aground on the Delaware River near Philadelphia on August 21, 1921, what day during that week would your prospects be best to be floated by the tide?
50. In the Race N. Y. how long after low water at New London does slack occur? (See page 434, Atlantic Coast Tide Tables; also pages 416 and 439.)
51. When are the best moonlight nights during the month of August, 1921, at New York? (See pages 484 and 493, Atlantic Coast Tide Tables.)
52. What are the chances of getting fuel and supplies at Port Washington, Long Island, New York? (This information may be had from Part IV, Coast Pilot.)
53. In going from New York to Florida in a motor boat what harbors may be safely entered between Beaufort, North Carolina, and Southport? (This information may be had from the Inside Route from New York to Key West.)
54. What lights are specified by the Pilot Rules to be carried on a vessel moored or anchored and engaged in laying pipe or operating on submarine construction or excavation?
55. When on account of bad weather the side lights cannot be kept in place, what action is permitted by the Pilot Rules on boats of less than 10 gross tons?
56. On steam vessels how much higher must the after white range light be than the forward white light?
57. What do the Pilot Rules specify about the use of searchlights?
58. How much later does high water occur at Albany than at New York City?
59. Albany is 140 miles from New York. With a ten-mile an hour boat how much before or after the time of low water at New York should such a boat leave New York to carry a favorable current up the Hudson?

The following whose papers were received during May have passed lesson No. 1: G. W. Boomer, J. J. Burnard, Mrs. A. R. Burr, L. F. Brown, A. C. Des Brisay, E. F. Cook, E. Chase, R. Dame, R. Homan, O. Hille, H. Hulburd, D. J. Kendall, J. Lang, W. A. Mathewson, Jr., C. A. Philpott, J. J. Rathbun, L. K. Swan, F. Scadden, C. Tienmeyer, W. Thomas, J. C. Taylor, J. R. Taylor, W. Volz, E. T. Youngfelt.

The following whose papers were received during May have passed lesson No. 2: D. E. Ackley, A. F. Alexander, W. B. Barnett J. L. Barnes, C. Baron, Gould Baxter, W. H. Bisbee, C. M. Blum, W. G. Boyden, S. M. Bradley, C. A. Brown, H. R. Broll, W. S. Betts, W. A. Butler, H. Byers, G. Bissett, A. R. Burr, Mrs. A. M. Burr, G. W. Boomer, J. J. Burnard, E. L. Chase, W. A. Cornell, W. J. Cummings, R. A. Crosthwaite, E. M. Conner, O. L. Crossley, A. L. Coffey, A. Dingman, G. A. Doerrer, L. DuBois, C. B. Downs, T. Dolan, W. Dursdill, R. Dame, A. Eppler, W. D. Groesbeck, F. D. Greene, J. E. Gerich, E. Halliday, R. D. Harding, L. L. Harrington, W. A. Hart, G. Hill, G. Holub, H. R. Houser, I. P. Horton, J. B. Hooper, C. H. Howell, W. Hannemann, L. B. Larsson, J. R. Leonard, F. Lewis, J. W. Lough, W. B. Landreth, W. C. Malin, E. Matson, L. F. Merritt, L. T. Mills, C. H. Moore, A. Moulton, A. A. Moore, Dr. P. D MacSween, D. J. McCarthy, W. M. McVey, F. Pope, C. A. Philpott, L. R. Philpott, R. S. Pollack, A. D. Porter, R. V. Parke, Mrs. C. A. Philpott, A. M. Reese, J. Reinhardt, J. H. Rogers, E. Roxby,

(*Continued on page* 106)

Advertising Index will be found on page 118

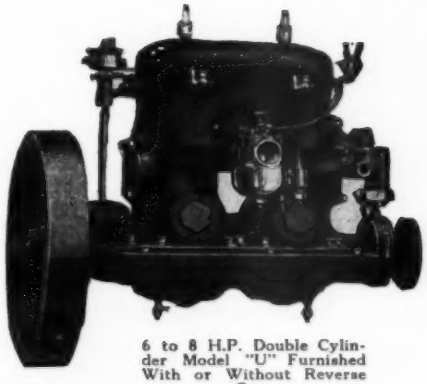
Gray Marine Motors for 1921

"the engine with the Big crank shaft"

New "V-M" 4-cycle valve-in-head motor furnished with Bosch Magneto with Impulse Starter—no batteries required — also furnished with Electric Starter.

Your DEPENDABLE Power Plant for Work Boat, Cruiser or Runabout.

The New York State Barge Canal tried out 4 model "V-M" Gray Motors in 1919 with other leading makes. Last year they put in commission 35 more Grays.



6 to 8 H.P. Double Cylinder Model "U" Furnished With or Without Reverse Gear

OVERHEAD valve marine-motors are acknowledged to be of greater efficiency and power than other types and in the Gray the ultimate of valve-in-head marine motor perfection has been attained.

The Gray is designed to operate on either gasoline or kerosene, it cannot backfire, it burns the fuel keenly with practically no carbon, soot, smoke or odor and lubrication troubles are unheard of in the Gray.

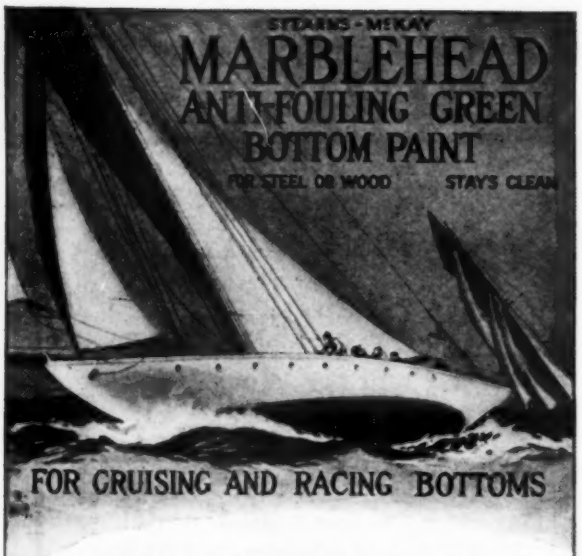
Our Hot-Spot Cylinder Head gasifies thoroughly the fuel used and renders it completely combustible.

Gray Two-Cycle Motors are built in models from 3 to 8 h. p. Gray Four-Cycle Motors are built in three sizes, 10 to 50 h. p. Write for FREE literature.

Selected for Canoes, Row Boats and Small Launches. 3-8 H.P. 2-cycle Gray Motor. Standard the World Over.

Leading Boat Builders for upwards of 15 years have specified Gray Engines as standard equipment for their boats.

GRAY MOTOR COMPANY 2106 MACK AVE., **Detroit, Mich.**



A hard slippery finish that lasts a long time and increases speed—each additional coat adds to efficiency. A powerful wood preservative and preventive of marine growth and destructive borers, it saves its first cost many times over by eliminating expensive repair, scraping and repainting work.

FOR TOPSIDES

Full and Semi Enamel Yacht White

Advice and consultation free on all painting and repair work

STEARNS-McKAY MFG. CO.
MARBLEHEAD MASS. U.S.A.

Huff, Daland & Company

announce the completion of their facilities for the production of high grade

Motor Boats and Flying Boats

Mr. Joseph Leyare, well known among boat owners as the proprietor of the former Leyare Boat Works of Ogdensburg, has been retained as designer and superintendent of the motor boat department.

The personnel of this organization combines experienced administrative officers and boat builders of unusual skill.

Let us figure on your 1921 boat.

HUFF, DALAND & COMPANY, Incorporated
OGDENSBURG, NEW YORK

Motor Boats Flying Boats Airplanes

The Compass as a Common, Convenient and Correct Companion

(*Continued from page* 78)

cardinal point toward a 22½-degree point; that is, toward North Northeast, East Northeast, East Southeast, South Southeast, South Southwest, West Southwest, West Northwest and North Northwest. The United States Navy method is to name the quarter points from North and from South towards East and West, excepting that the division adjacent to a cardinal or inter-cardinal point is always connected with that point. This method is shown in II.

On the new card instead of working only from 0 to 90 for the degree designations we start with 0 at N as before and give each of the degrees all the way around the compass card a distinctive name using the designations from 0 to 360 degrees. Thus each will be 90 degrees as on the old card, but South will be 180 degrees, West 270 degrees, Southeast 135 degrees, Northwest 315 degrees, etc., etc. In this method of compass card markings it will not be necessary to use any North, East, South or West designations in connection with the degrees. To steer a course corresponding to Northeast it will be called 45 degrees and not North 45 degrees East.

Fig. 148 gives a complete comparison of the point and degree methods of naming compass directions. It is not assumed that this table will be memorized but its existence should be kept in mind for future reference.

Correspondence Course Attracts Attention

(*Continued from page* 104)

F. Rudolph, F. E. Roberts, F. J. Rathbun, Major C. P. Shinn, H. R. Sherman, J. K. Sexson, O. H. Sherbrook, W. Slocum, C. T. Smith, V. D. Smythe, C. E. Smith, D. Spoor, W. Strauss, F. Shay, L. K. Swan, F. Scadden, A. A. Thomas, C. P. Tockildsen, T. E. Trombla, F. E. Tuttle, I. Teasdale, J. R. Taylor, H. Underwood, L. Voyt, F. B. Watson, R. F. Wallace, C. Weltner, C. Williamsen, H. L. Young, E. T. Youngfelt.

The following whose papers were received during May have passed lesson No. 3: A. E. Anderson, M. L. Anderson, R. Andren, W. B. Barnett, J. L. Barnes, Gould Baxter, Percy S. Benedict, Dr. A. B. Bennett, U. L. Berger, F. H. Berry, J. Bertram, J. Bister, W. Bliss, W. G. Boyden, H. Boche, L. F. Brower, W. S. Betts, C. E. Burch, H. Byers, Dr. F. G. Brown, A. R. Burr, J. J. Burnard, Mrs. A. R. Burr, J. Calvert, E. L. Chase, G. M. Clubb, W. A. Cornell, L. L. Crosthwaite, C. H. Culver, L. Chapman, A. L. Coffey, R. Dart, F. H. Delano, W. W. Dickson, A. Dingman, J. Dunbaugh, T. Dolan, W. Dursdill, I. S. Ellsworth, A. J. Fenton, R. Finigan, E. F. Folda, V. Francis, W. R. Folsom, W. H. Goodman, W. J. Gorton, W. H. Gray, C. E. Brush, W. C. Gustofsen, G. F. Hacken, J. A. Hain, Rev. A. M. Hainer, G. Hansen, Ray Harding, W. A. Hart, G. Holub, C. Houlroyd, L. H. Howe, G. D. Hoyns, I. P. Horton, C. H. Howell, M. R. Johnson, E. J. Jones, A. E. Jones, E. Kershaw, Mrs. E. G. Kaiser, J. Kellner, F. J. Kensler, E. Kenyon, W. C. Kress, C. M. Labunski, L. B. Larsson, G. R. Law, J. B. Losee, J. F. Lowcock, W. B. Landreth, J. Morarec, H. A. Morton, W. B. Moores, C. H. Mulvihille, D. C. McLean, P. F. McMahon, J. McHenry, F. Mitchell, G. B. McCluskey, E. Mathews, J. A. Needham, M. S. Noyes, W. R. Palmer, F. Pope, R. S. Pollack, H. H. Powel, A. D. Porter, G. A. Patrie, R. V. Parke, H. Quick, J. Rawlinson, J. Reicherter, R. B. Rives, W. W. Robson, W. S. Roedel, J. H. Rogers, M. B. Ross, E. Roxby, G. Schumakoff, Dr. J. F. Schefcik, H. P. Shay, O. H. Sherbrook, J. H. Shrieves, W. E. Sisson, S. E. Slocum, W. Slocum, D. O. Smith, A. D. Smith, B. T. Smith, F. B. Smith, Fred B. Smith, C. E. Smith, H. R. Stiles, P. R. Stephanson, M. Stelle, W. Strauss, D. H. Swiler, A. C. Swift, H. L. Stanley, S. Steinmetz, A. E. Sunny, T. Steiniger, E. Swayne, H. H. Sellew, J. L. Saegmuller, L. K. Swan, D. Taylor, W. H. Taylor, O. A. Thomas, S. H. Thomas, G. H. Thurston, C. P. Tockildsen, E. E. Torchio, I. Teasdale, H. Underwood, H. E. Watkins, C. Weltner, L. E. Wilson, W. O. Yates, C. S. Young, M. A. Young, E. T. Youngfelt, H. T. Zachgo.

Gar Jr. II Reaches Detroit

(*Continued from page* 16)

we were just fast enough to stay on top of this ebb tide the entire distance to Albany. Yet we had every reason to believe that we could better Flyaway's time even if the odds were against it.

(*Continued on page* 110)

Rebuilt Marine Engines
IN CHICAGO

These engines are completely overhauled, rebuilt and refinished by our marine engine experts. Look like new, run like new, and are thoroughly guaranteed. Here's a chance to get a high-grade motor at a big saving.

Our present stock includes Sterlings, Domans, Grays, Buffalos, etc., taken in trade for new engines. Write today for latest list if you want a real bargain.

W. L. MASTERS & COMPANY
231 North State Street Chicago, Illinois

Agents for Sterling, Scripps, Frisbie, Kermath, Universal, Gray & Evinrude Motors. New engines and repair parts always in stock.

Advertising Index will be found on page 118

KERMATH

SERVICE, YES SERVICE!

THAT'S what owners of Kermath powered boats get from their engine year after year.

Hundreds of them write and tell us so.

For proof of these statements we ask you to talk to any Kermath owner. Ask him any question that you wish. He will be a Kermath booster, for a Kermath marine motor is always on the job.

Kermath economy and dependable day in and day out service are "built in" qualities—which are never lacking. Honesty in construction and inspection of every Kermath regulates that.

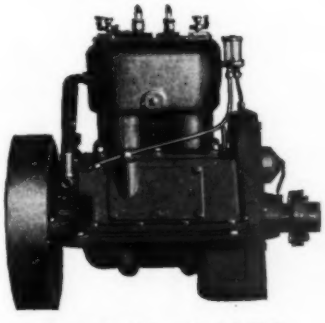
Having the right kind of a motor in your boat this summer is going to mean a whole lot to you. Now is the time to check this matter up.

Go to the Kermath dealer. He is an expert on marine motors and their use. He can tell you about different installation methods and what size motor you should have to fit that boat of yours.

Or write us direct for our free and instructive Kermath booklet. It will interest you immensely. Address Department "*D.*"

Kermath 4 cycle marine motors 4 to 40 H. P.
Prices, $230 to $1650. Immediate Delivery.

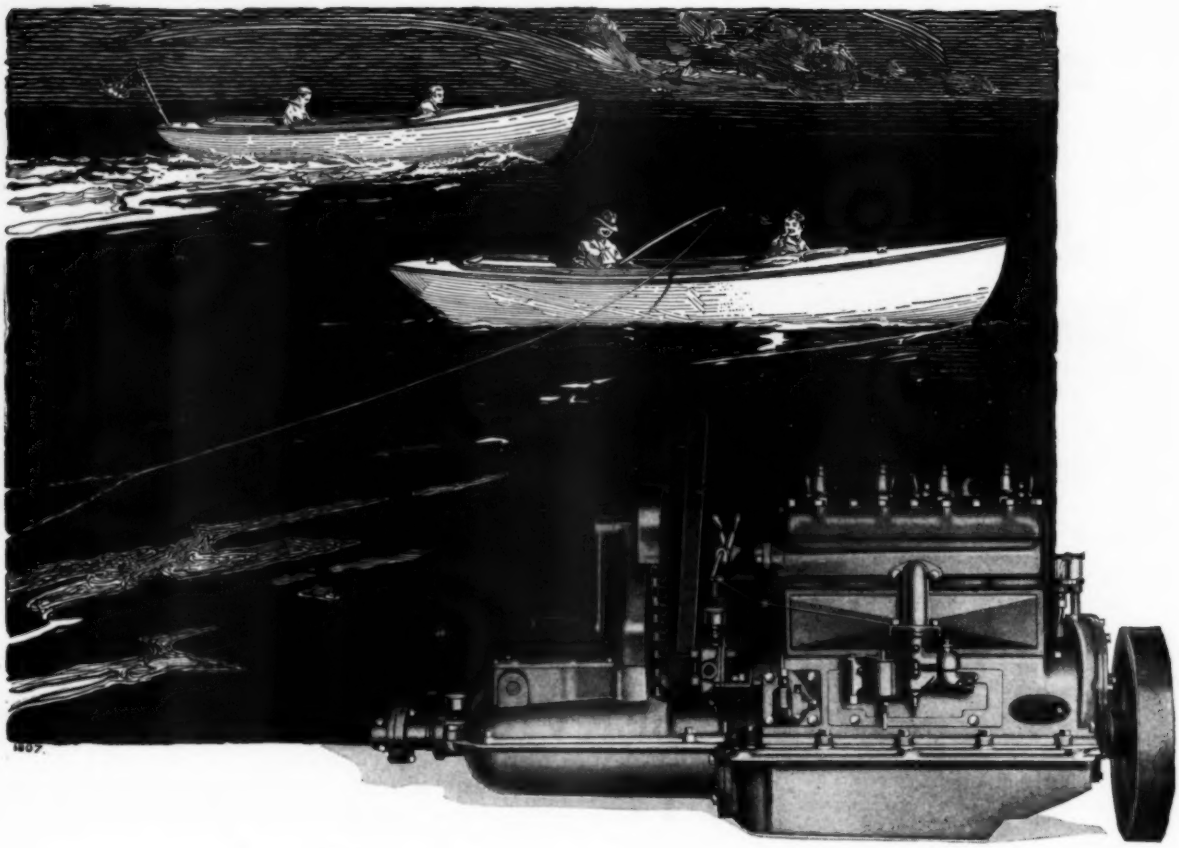
"A Kermath Always Runs"



Kermath 4-5 and 6-8 H.P.

This illustrates one of the smaller size Kermaths which we are now building.
Our Kermath booklet gives a complete description of every size Kermath. Write for it.

KERMATH M'f'g Co.
DETROIT MICHIGAN.



From trolling speed to 20 miles per!

WHY not have a boat that can glide along at trolling speed if *that's* what you want, yet can pick up speed to get you home quickly, when *that's* what you want?

The four-cylinder UNIVERSAL means more than just more power. It means smooth power, as steady, quiet and certain as the finest type of automobile engine.

Equip your boat with a UNIVERSAL—and you enter a new era of motorboat ownership. You've come into your "own"—a full-fledged motorboater with an engine that takes its hat off to none. You've *ARRIVED.*

It makes no difference what size or type of boat you figure on—the UNIVERSAL is adapted to 80% of them all—auto boats, speed boats, launches, fishing boats, work boats—from 14 to 30 feet in length. It takes the little fellows at 18 miles an hour or better and proportionate speed for other boats, according to size and type.

The UNIVERSAL is completely manufactured in the Universal factories by marine engineers of 22 years' experience. It has established a world-wide reputation for dependable power. It has become recognized as the *standard* 9-12 h.p. four cylinder marine engine. It is equipped with reverse gear or Electric self-starter, where desired.

Ask any UNIVERSAL owner what he thinks and see what he says. If he doesn't convert you to a UNIVERSAL enthusiast in a hurry, it won't be because he won't *try*. Thousands of UNIVERSAL fans are ready to tell you why they bought the UNIVERSAL and why they think you should. Get a UNIVERSAL this season and start a new deal in your motorboating. Find out the facts now—send for catalog today.

Universal

4-Cyl.
9-12 h.p.
MARINE ENGINE

UNIVERSAL MOTOR CO. Oshkosh, Wis.

Not connected with any other firm using the name "Universal"

Manufacturers of the Universal 4 k.w. and 2 k.w. four cylinder Electric Plants for lighting boats, summer camps and homes, farms, etc. Send for catalog.

Advertising Index will be found on page 118

For Racing—Cruising—Working
STANDARD
Reverse Gear

IT doesn't matter what kind of service your boat is built for. Of course you want the benefit of all the power your engine develops. For power developed means fuel burned, and fuel means money.

The Standard Reverse Gear transmits every bit of your engine's power. Its big smooth-acting clutch has excess capacity to carry any load you'll ever place on it. You can adjust the clutch from the outside while the engine is running. A ball thrust bearing built into the case carries the load without friction loss.

The internal gears are amply large with wide sturdy teeth, machined so accurately that they run quietly first, last and all the time. The bearings are large enough to defeat wear and fit close after years of service.

Aside from the quality of its materials and workmanship the crowning feature of the Standard Reverse Gear is its attractive oil tight case. It permits running the gear in a constant bath of oil that insures perfect lubrication and minimum depreciation through wear.

You'll like many other things about the Standard Gear.

Let us tell you about it.

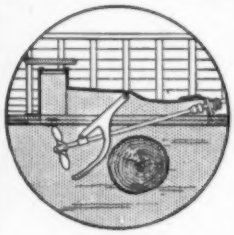
Write today for catalog and prices

STANDARD GEAR CO.

5928 Commonwealth Avenue

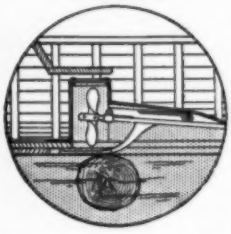
DETROIT, MICH., U. S. A.

The Propeller Is Safe from Rocks and Snags



With this boat you can go through shallow creeks or ponds —over sandbars or sunken logs —any place you can row. It is a

Disappearing Propeller Motor Boat



The moment Protecting Skeg touches a submerged obstruction, propeller disappears within boat leaving keelson perfectly clear. Motor is automatically throttled.

These boats are beautifully finished and built of highest possible grade material.

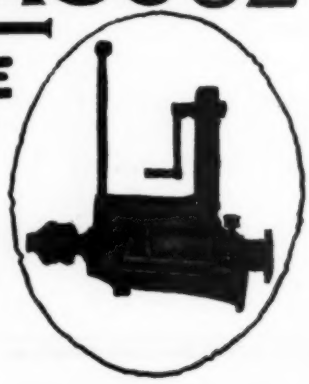
Motor is silent and economical: 9 to 9½ miles per hour—20 to 25 miles per gallon of gasoline.

DISAPPEARING PROPELLER BOAT COMPANIES

97 King St., W.
Toronto, Canada

731 Main St.
Buffalo, N. Y.

SYRACUSE REVERSE GEAR



NEW PRICES
July 1st, 1921
20%
LOWER

Don't postpone buying your new reverse gear any longer. Buy a Syracuse and get a gear that is up to the minute in design and construction—and in price.

The Syracuse Gear includes clutch, reverse gear and rear starter, all combined in one compact all-enclosed case. Perfect lubrication, silent, clean and free from trouble, this gear will give you perfect service at minimum cost.

Sizes 10 H.P. to 100 H.P. Readily installed in any type of boat with any engine up to 100 H.P.

Catalog with revised prices on request. Write today.

SYRACUSE GEAR COMPANY
SYRACUSE, N. Y.

Gar Jr. II Reaches Detroit

(*Continued from* 106)

Generally the run up the Hudson consumes the best part of two days but not so this time. The quiet old towns passed by with such speed that it must have made the oldest inhabitants dizzy. Yonkers in 25 minutes from 86th Street, New York, hardly seems the truth, Hastings in another 8 minutes, Nyack in 14, West Point not much more than an hour from New York and so on and so on all the way up. Newburgh, then Poughkeepsie, Kingston, Saugerties, Catskill, Coxsackie and then Albany just 5 hours after leaving New York.

The water was excellent for speed, not a ripple on the surface and the only thing that gave us concern was the many shad and fish nets. We dodged from east bank to west bank and back again many times to keep clear. But off Poughkeepsie they became so thick that we couldn't dodge fast and often enough to clear the nets without slowing down, so we slid over one and found that nothing happened. From then on we didn't change our course for fish nets but went right ahead just taking care not to hit the wooden floats used to buoy up the nets.

Near Peekskill we had a chance to compare our speed with that of a train on the New York Central which was running parallel to our course. The train was a local and while it was able to get slightly ahead of us between stations yet the few minutes it consumed at each stop was more than enough to allow us to soon get well ahead of the train and by the time we were abeam of Newburgh the train was out of sight astern.

Before we left New York we had called the Commissioner of Public Works on the telephone and requested that a permit to go through the barge canal be sent down to the Albany Yacht Club so that it would be waiting for us when we arrived as we wished to lose as little time as possible. But Gar Jr. evidently travelled faster than it is possible for government officials to move or the mails to carry a few blocks for when we did arrive no permit was waiting so we had to tie up for the night near the Albany Yacht Club and go scouting for the permit which we found at 7:30 the next morning still resting peacefully in the postoffice although it was postmarked 11 A. M. the day previous.

As soon as the permit was obtained we got underway with no further delay as we wished to make the canal run to Buffalo in two days and this meant that we must keep underway most of the time during daylight if we wished to avoid night running on the canal.

The barge canal between the Hudson River and Buffalo on Lake Erie is not a canal for a good portion of the way in the way the term canal is generally understood. The State of New York has made use of the natural rivers and lakes along the route and has canalized these. By dredging and filling and by building large dams here and there a waterway has been constructed across the State of New York which more nearly approaches an immense river or lake.

In distance the Barge Canal measures 351 miles from Troy to Buffalo. It contains thirty-four locks. Most of the locks in going west are "lifts" although there are a few which go down. The canal is well buoyed for day navigation and lighted for night work. There are no tolls or other fee other than the permit which is granted by the Commissioner of Public Works at Albany without charge.

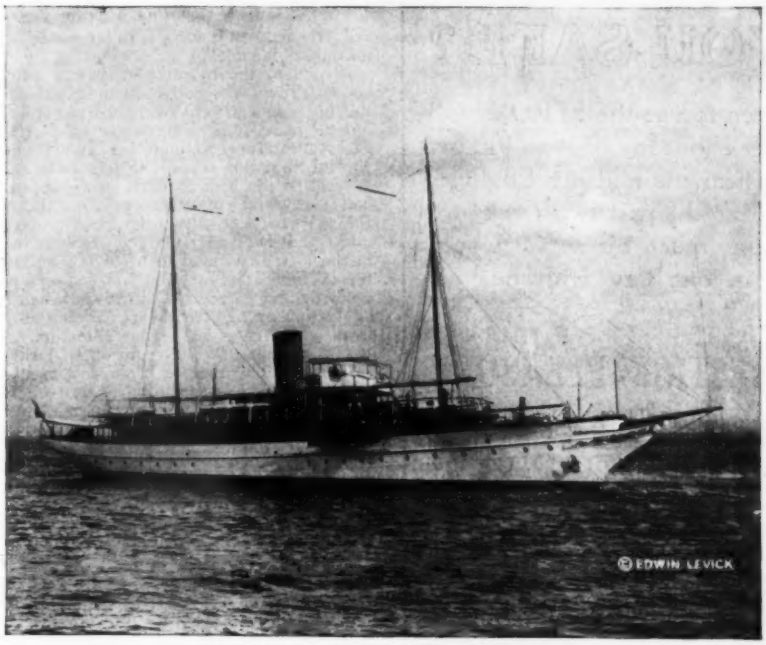
The scenery along the entire route is superb. As a cruising ground it is hard to imagine a better one for those who are willing to forego the delights of deep sea navigation and off shore work. Locations to tie up for the night abound and there

(*Continued on page* 112)

All Sizes Rebuilt Marine engines from one to 300 H.P. 4 cyl. 4 cycle GLOBE 10 x 14", reverse gear, magneto, 48" propeller, $6,000.00. Pair STANDARD 300 H.P. 12 x 14" reversible, cost $25,000.00 each, price $4,000 each. Many other large and small four cycle and two cycle engines, for work boats, yacht, cruiser or tender. Write for list.

Hamilton Marine Engine Exchange 440 Fifty-Second St. Brooklyn, New York

Advertising Index will be found on page 118



S. S. Sialia, owned by Henry Ford. Designed by Henry J. Gielow, New York City. Built by Pusey & Jones, Wilmington, Del. Equipped with Clothel Refrigeration

Dry, Sanitary Cold Automatically— Clothel Household Refrigerator

The pronounced advantages of electrical refrigeration were recognized years ago in the commercial field.
Today the Clothel Household Refrigerator makes this superior method available for the home.

The same principles and standard of quality are followed that have made the Clothel System so successful on America's large yachts and motor boats.

The Clothel is an absolutely safe, attractive and complete refrigerator that keeps food fresh and wholesome with a dry, sanitary cold constantly below freezing.

The motor starts and stops automatically within a narrow temperature change. Silent running. No vibration. Economical.

Write for booklet which fully explains this cleaner, healthier, more convenient system of refrigeration.

The smaller of two sizes of Clothel Electrical Refrigerators for home use

The Clothel Refrigerating Company
61 Broadway New York
N. H. Rockwell, New Orleans
The Canadian Clothel Refrigerating Co., Ltd.
17 St. John St., Montreal

ARE YOU SAFE?

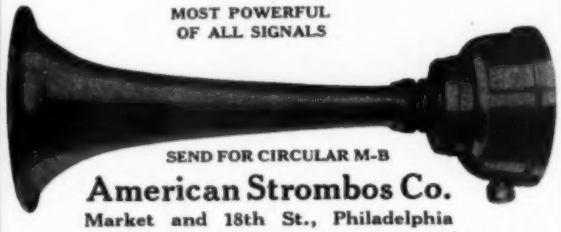
"Since I started to use the STROMBOS I feel much safer about my boat as I know everybody will hear me and my Engineer tells me that during the past two weeks we have used only as much air as we would ordinarily use in one day with our air whistle."

SAFETY-PRESTIGE-PLEASURE

Are Naturally Yours With a

"STROMBOS"

MOST POWERFUL OF ALL SIGNALS



SEND FOR CIRCULAR M-B

American Strombos Co.

Market and 18th St., Philadelphia

NEW YORK, 507—5th AVENUE

TIEBOUT FOR HARDWARE

Let us help you keep your boat shipshape—fitted up to withstand the strains of the summer cruises. We carry in stock for

Immediate Delivery

a complete line of marine hardware and supplies—from nail to anchor.

Our illustrated catalogue, with sizes and prices indicated, is a wonderful help for keeping a boat in condition.

Copy of catalogue on request.

W. & J. TIEBOUT

Established 1853 Incorporated 1892

118 Chambers St. New York City

Gar Jr. II Reaches Detroit

(*Continued from page* 110)

are frequent stations along the route where fuel and supplies may be obtained.

It was in the morning when we entered the first lock just above Troy. We had no sooner passed our lines ashore than the big gates astern swung closed and the locker tender gave her the water and we began to raise. In just twenty minutes the gates ahead opened and Gar Jr. II passed out of tide water for the first time since she left Detroit last fall.

Most of the lock tenders were expecting us so many of them had everything in readiness. As the canal had been opened for navigation only two days before no great amount of traffic interfered with us. Only once were we held up with a tow in the lock ahead and then for only a few moments. As a matter of fact, after we had run for about three hours we caught up with and passed all the tows which had gone through since navigation opened, so the remainder of the distance we met no tows whatever going in our direction.

The amount of time required to lock us through varied considerably. The shortest time was eight minutes and the longest about thirty. It averaged between fifteen and twenty minutes per lock. Some delays seemed purposely planned by the lock tenders to give the many curious ones who gathered at the lock a longer time to look us over. The publicity which we had received in the daily press due to the fact that we had beaten a train between Florida and New York had carried to the farthest corners of the earth. Everyone knew the story of the run up the coast, many asked about the fish that ate our log line and many other questions in reference to the sea trip.

The power plant of Gar Jr. II was the source of greatest interest. Everyone seemed to know that she was powered with Smith Marine Motors. At every lock many natives climbed aboard and the companionway leading to the engine room contained as many heads as it was possible to get into the space. Gar let every one who cared to come aboard to look the ship over and answered as many of their questions as the limited time we were in the locks permitted. Generally the last of the answers had to be shouted as we were leaving.

The small amount which Gar Jr. II disturbed the water in the canal was surprising. We feared that we would have to run very slow to prevent making a wash that might cause damage to the canal banks. But we found that the slower we drove the boat the more wash and waves there were. The reason for this is obvious. At speed Gar Jr. was planing, was on top of the water so to speak, and as little water was being displaced or disturbed there was naturally no hole to fill as the hull passed along. However, the moment the boat was slowed down she settled in the water, began to drag water and make an awful fuss. For this reason we were able to run nearly full speed without any damage to the canal banks whatever.

The distance between locks varies from a fraction of a mile to many miles. The longest level was about sixty miles. The amount of lift at each lock also varies considerably. The smallest was about ten feet and the greatest was about forty.

Sailing on Gar Jr. along the canal was not unlike riding on the 20th Century Limited which runs along the same route. As we were only a few feet from the canal bank all the time, the sense of speed was many times greater than at sea. The telegraph poles seemed to pass with as great rapidity as when viewed from a railroad train. The curves and bends in the canal came into view ahead so rapidly and seemed to pass astern in less time than it takes to tell about it. Along some positions of the route the bends came so fast and frequently that it was necessary for the helmsman to keep on his toes every minute. At times the inboard motor had to be throttled for an instant so that we could make the turn. As Gar Jr. banks well when making a turn it reminds one of the old bicycle days when speeding along a crooked highway.

At every town and city which we passed through the canal banks were black with people to get a glimpse of us but only a glimpse it was for we were no sooner abreast of them than we had passed and then out of sight around a bend ahead.

The bridges that we had to pass under were favorite points of vantage. It surely must have been a strange sight for the natives to see us go through and past their towns at perhaps a 30-miles-an-hour clip after viewing canal boats for years and years pass quietly and serenely by at a speed of perhaps three knots.

The awe and astonishment of these people as we passed reminded us time and time again of how little the people of our country know about boats, marine engines and the possibilities and joys of boating generally. Here was a boat right before their eyes going at a speed which it is doubtful even one of the millions who saw us ever dreamed was possible. Yet Gar Jr. II is only a crude example of what could be developed along speed cruiser lines if the proper attempt was made. She has proven that such speeds and seaworthiness are possible, but she is only one and the first step in the right direction. No one dares guess what the limit of development would be if the gov-

(*Continued on page* 116)

Advertising Index will be found on page 118

An Achievement in Small Craft Design

DESIGNED by one of the foremost naval architects—built by a company with a lifetime of experience in building small craft, the Burger 36 Ft. Cruiser is a masterful example of what has been accomplished by incorporating the comfort and roominess of larger and more expensive boats into a graceful and well-built cruiser, but thirty-six feet long.

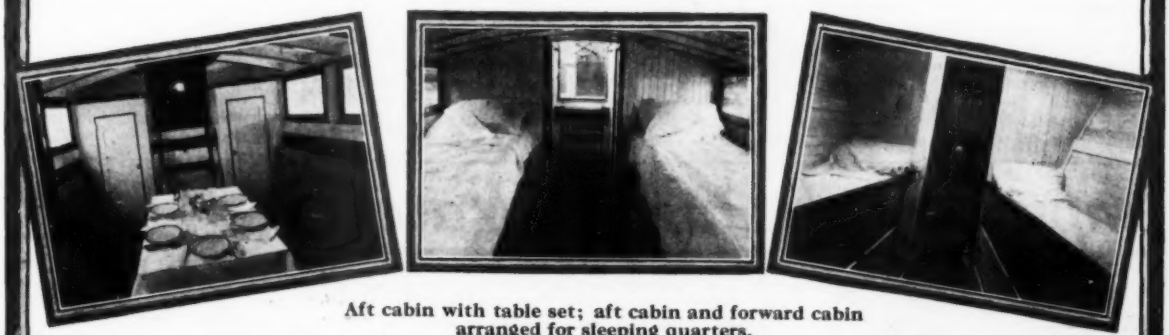
The pleasing lines and balance of the Burger 36 Ft. Cruiser, together with its ample deck room and commodious arrangement below, recommend it to the discriminating buyer who is looking for a value extraordinary in small craft.

The spaciousness of the aft cabin is a feature much appreciated in this cruiser. For a lounging room, sleeping quarters or dining room, it is ideally adapted to accommodate six people. Its arrangement is convenient and comfortable and access may be gained by the forward companionway leading to the bridge deck or the aft companionway opening out on the after deck.

The forward cabin is equipped with two roomy berths and eight large drawers. Two lavatories and a well-arranged galley also add to the accommodations of this fine cruiser and the engine room affords two bunks, a work bench and cupboard for parts and tools.

We will gladly send you our handsome book containing photographs and a complete description of the Burger 36 Ft. Cruiser

BURGER BOAT COMPANY, Manitowoc, Wis.



Aft cabin with table set; aft cabin and forward cabin arranged for sleeping quarters.

Immediate deliveries from stock. Price without war tax, $4950.00 delivered at Manitowoc, Wis.

BURGER

BOATS BEAUTIFUL

We also build a 26 ft. Runabout, designed by John L. Hacker. Speed 25 miles. Complete details on request.

Yacht Construction *Repairs, Outfitting, Storage*

PORT JEFFERSON MARINE RAILWAY CO.

PORT JEFFERSON, N. Y.

Large Railway 1000 tons cap'y, 15 feet draft.
Small Railway 300 tons cap'y, 10 feet draft.

Gasoline, water, yacht supplies *Excellent harbor, all facilities*

"Gar" Wood—the Man

(*Continued from page* 23)

appreciated by a number of Detroiters that he was presented with a special cup.

Late in 1916 Wood purchased "Miss Detroit" from the Miss Detroit Power Boat Association, a syndicate of prominent citizens who had subscribed a fund to use in building Miss Detroit, which won the National Speed Boat championship for the Automobile City.

The following year Wood went after wider honors. He built still another craft during the winter time, that is, Chris Smith and Chris Smith's sons built it, in company with Wood and with his assistance. This boat was christened Miss Detroit III, in the spring of 1918, and it was the first hydroplane ever successfully equipped with an aviation engine, carrying a Curtis 12.

With Miss Detroit III, Wood won the Thousand Islands trophy and again landed the Gold Cup, emblematic of the American speed boat championship. He also finished first in the Canadian International Gold Challenge Trophy Race at Toronto but was disqualified for accidently cutting a stake.

Wood still had Miss Detroit II and with this earliest built boat he captured the Webb Trophy in the Mississippi Valley Regatta at Moline, Illinois. In 1919 Wood again brought out Miss Detroit III to defend her honors and the boat again came through for him, once more winning the Gold Cup.

Having conquered everything in sight in his own country, Wood turned to other shores. England held the Harmsworth trophy, emblematic of the World's speedboat championship. England had held it for several years, and England expected to continue holding it. Wood pointed his efforts toward lifting it.

After the race season of 1919 closed Wood began laying definite plans for an invasion of Great Britain. His manufacturing achievements were paying him good dividends. He had become a wealthy man and with the riches he intended to go the very limit with his hobby; he decided to bring back the world's race boat championship to the United States.

Wood talked to Smith, the Boat Builder. Together they planned Miss America and Miss Detroit V, both twin-engined hydroplanes. He presented Miss Detroit V to his son Garfield A. Wood, Jr.

Last summer Wood went to England, taking both boats with him. It was a costly undertaking. The expense did not matter with Wood; he wanted the title brought back to America.

The international championship races were staged at Cowes, Isle of Wight, on August 10th and 11th. Miss America, averaging 66 miles an hour, won the event and Miss Detroit V finished second.

The Harmsworth Trophy came back to Detroit with Wood in August and in September he again won the Gold Cup and with Miss America in the One-Mile North American Championship made this distance at the rate of 78.23 miles per hour, making a greater speed than any motor boat had ever previously traveled, while in winning the Harmsworth Trophy he made a speed of only 66 miles an hour showing that he had much reserve speed.

While in Miami, Fla., last winter he entered his boat Gar Jr. II in the Express Cruiser Championship and won. Shortly after he won two ocean races and early in the spring decided to drive his boat from Miami to New York in less time than it required an express train to make it. Not only to beat the train time but to demonstrate that the Smith Marine Twin-Six high-speed motors and a light weight hull could and would stand up at sea for forty to fifty hours of continuous service at full speed without attention to the engine and with convenience to the passengers and crew.

Wood covered the 1300 miles in 47 hours and 25 minutes, thus beating the train time by 29 minutes but not satisfied with this he set another record between Miami, Fla., and Detroit, Michigan, via Hudson River, New York Barge Canal and Lake Erie, a distance of 2200 miles in 84 hours.

Early in September of this year the English sportsmen will endeavor to take the Harmsworth trophy back with them. French and English boat and engine builders are reported to be very busy building new speed boats which are designed to make the greatest speed that has ever been shown in the world over the Detroit course but that Gar Wood will have to be reckoned with is an assured fact and the keel of the defender Miss America II was laid at the Detroit Yacht Club June 7, 1921. This boat will be powered with four Smith-Marine Twin-Six Engines and will develop some 1600 h.p.

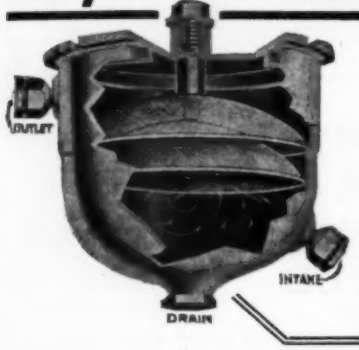
It is no simple matter to drive one of these high-powered boats at a speed from 65 to 86 miles per hour and one of these boats skims along the surface like a swallow apparently touching the water now and then or bobs up and down like a bucking broncho, it requires nerve and skill to pilot them to victory.

His position in the manufacturing world today enables him to continue his hobby along lines that would be discouraging to most men. He operates two hoist factories and an immense steel body manufacturing plant in Detroit, a plant in Milwaukee, one in Windsor, Ont., and an assembly plant in Paris, France.

Gar Wood, as he is familiarly called by his friends, is tall and slender, his hair is gray and he is usually smiling. He is modest but when the Harmsworth trophy was presented to him at a dinner by Sir Edgar MacKay in England last summer one of his English friends said he made a very fine typical humorous American speech.

So while Gar Wood contends that there is no such a thing as luck and he continues to smash records and do things worth while in the industrial world, his friends still tell you that for days and days before the Harmsworth races in England the wind blew high and the course was rough—too rough for lighter boats, but that the morning of the races the sun came out brightly and the wind died down and the weather was ideal for the three days' racing, after which it clouded up and became rough again. His mechanician said, "Gar Wood's luck."

Impure Fuel Due to Water! **KLEENGAS PURIFIER**



Fully 90% of your carburetor trouble is caused by water and dirt in your fuel. You can prevent this trouble entirely with a KLEENGAS PURIFIER.

You can't prevent water from collecting in your fuel tank and line—it condenses from damp atmosphere as well as the water in the gas or kerosene you buy. You can't prevent sediment, dirt, fluff, rust, impurities—some scales off the tank lining—some comes in the gasoline itself. But you can prevent all the troubles caused by these impurities.

KLEENGAS is a high grade PURIFIER scientifically designed, simple in construction and made of the best non-corrosive materials. Aluminum bowl, double parabolic fine mesh bronze screens, brass drain tap at bottom. It cleans itself by the swirling motion, the impurities dropping down so they don't clog the screen. Large capacity allows full gas flow and requires only occasional draining.

Order a KLEENGAS today—$10.00 postpaid. Money cheerfully refunded if not as guaranteed. Hundreds in use. Easily installed—no soldering.

Excellent proposition for distributors and dealers—write

THE NATIONAL AUTOMOTIVE MFG. CO.

822 CHAMPLAIN AVE., N. W. - - - CLEVELAND, O.

Advertising Index will be found on page 118

Radically Different —and Better

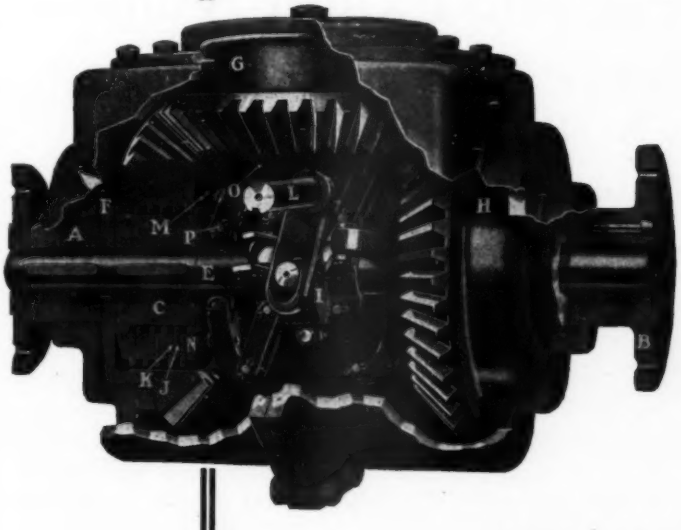
McKinnon Reverse Gear

THE McKinnon Gear is such a radical improvement in design and principle over the ordinary reverse gear that its construction is worth the special study of every boatman who has to buy or use a reverse.

Study the illustration below. Note the three big bevel gears, their large teeth and the broad contact surface of every tooth. Compare this strength and simplicity with the multiplicity of little spur gears in other reverse gears.

The ordinary reverse is the planetary type, a type widely used for automobile transmissions, fifteen to eighteen years ago, but now used in only one very low priced car. It was found that planetary gears would not stand hard service because they had so many small gears, pins, bearings and wearing surfaces. We predict that they will also be discarded for marine reverse gears within a few years.

The McKinnon Gear contains two large multiple disc clutches, one for forward drive and one for reverse. These clutches have far more friction surface for their size than any other type of clutch. They engage smoothly, hold firmly and can be intentionally slipped for considerable periods without heating up or harm to the clutch.



McKinnon Gears have been tested in the mechanical laboratory with the most improved scientific testing apparatus. They have been tested in real boats under unusually difficult service conditions. You'll find them without question the best gears you can buy. Let us prove it.

These sizes ready in quantities May 15th

No. 1 transmits 4 H.P. per 100 R.P.M. No. 2 transmits 8 H.P. per 100 R.P.M.

Two sizes ready for delivery

No. 3 transmits 13 H.P. per 100 R.P.M. No. 4 transmits 20 H.P. per 100 R.P.M.

Absolutely Guaranteed for One Year—Other sizes in Construction

Write today for description and prices, giving details of your engine including R.P.M.

McKINNON IRON WORKS COMPANY

ESTABLISHED 1880

ASHTABULA OHIO

Gar Jr. II Reaches Detroit

(*Continued from page* 112)

ernment would become interested as they should and study and perfect high speed craft instead of leaving it to the brains and pocket book of one citizen, Gar Wood, to do this for the entire nation.

Millions are spent every year by the government on and for air craft but from many standpoints the fast motor boat and speed cruiser has many advantages over the airplanes, yet not a cent is appropriated by our government for even a study of this important and vital branch of commerce and national development. Navies cost billions but they could be destroyed by a fleet of motor boats costing less than one per cent of that amount if we know how. There are 1,000 automobiles in this country for every motor but there is no comparison for health and enjoyment between a car and a boat. But the people will never know unless they are taught. This has been one of the objects of the trip of Gar Jr. II.

The canal trip ended at Buffalo which was made in the two days as scheduled. A more propitious ending could not have been. Commodore Ralph Sidway of the Buffalo Launch Club and Arthur J. Utz of the same organization and treasurer of the American Power-Boat Association had been watching our progress up the coast and across New York state toward their city and had worked out the most elaborate and cordial reception that could be extended to even returning heroes. Of course the yachtsmen and motor boatmen of Buffalo are noted for their hospitality and know just how to plan and carry out these expressions of cordiality and good fellowship, but the reception which was accorded Gar Wood and his crew when they reached Buffalo outshone any of their previous successful functions.

Long before Buffalo was reached Commodore Humphrey Birge's Great Lakes express cruiser Miss Liberty was seen ahead with a large reception committee headed by Commodore Sidway aboard. Gar Jr. headed down and ran alongside of Miss Liberty and the committee including Sylvester Eagan, Ward E. Wickwire, Roscoe R. Mitchell, Clarence S. Sidway, Herbert C. Peters, William J. Connors, Jr., W. A. Coyt, Arthur J. Utz, and Frank H. Wattles came aboard. From that minute things happened with such rapidity that even the crew of Gar Jr. II, who had grown accustomed to moving rapidly, had to step lively.

In the evening Commodore Ralph Sidway gave a dinner at the Saturn Club in honor of Commodore Wood at which the crew of Gar Jr. II was present as well as all prominent motor boatmen of Buffalo.

SUMMARY—MIAMI, FLA., to DETROIT, MICH.

Date	Mileage From Miami	Mileage For Day	Running Time From Miami	Running Time For Day	Speed (mph) From Miami	Speed (mph) For Day
April 25—From Miami to Savannah..	459	459	17–26	17–26	26.4	26.4
April 26—From Savannah to Morehead City	766	307	23–25	10–59	26.95	28.0
April 27—From Morehead City to Norfolk	942	176	25–00	6–35	26.9	26.7
April 29—From Norfolk to Sandy Hook	1234	292	46–28	11–28	26.6	25.5
April 30—From Sandy Hook to New York	1257	23	47–15	0–47	26.6	29.4
May 2—From New York to Albany.	1394	137	52–20	5–05	26.6	26.8
May 3—From Albany to Lake Oneida	1533	139	58–44	6–24	26.1	21.7
May 4—From Lake Oneida to Buffalo	1750	217	69–00	10–16	25.4	21.2
May 5—From Buffalo to Rocky River.	1939	189	76–08	7–08	25.4	26.6
May 6—From Rocky River to Detroit.	2036	97	80–36	428	25.4	21.1

Get Ready for Bigger Business

Annual Commercial *and* Export Number

You should use large space in September

MoToR BoatinG

BIG business leaders are predicting a slow but steady revival of trade which will eventually become the greatest and soundest period of prosperity this country has ever known. Good business can be expected when the movements now under way are completed, for example the reduction of prices and labor costs, the improvement of foreign exchange, the settlement of war reparations, the inevitable readjustment of world conditions which must follow a great war.

Motor boats are destined to become greater factors in the field of commercial transportation and export trade. This industry will prosper in the degree that it keeps up with other American industries in the revival of good business.

September MoToR BoatinG will feature the commercial and export sides of the marine industry. In addition to all of its regular editorial features, extra attention will be given to these two important fields. Readers are given extra value through the added editorial features. Advertisers are given extra value through extra circulation.

A full size copy of September MoToR BoatinG will be mailed to every boat builder, dealer and engine manufacturer, and to all American Business Consuls. In addition to this we will send a special reprint containing only full page advertisements to every Commercial boat owner in America, to hundreds of exporters, foreign manufacturers, dealers and owners. Send us a list of your own foreign agents—we will send this without expense to you or to them.

Decide now what space you will use, and start preparation of your copy. Or ask our Service Department to help you — no charge. Final advertising forms close August tenth.

MoToR BoatinG, 119 West 40th Street, New York, N. Y.

Advertising Index will be found on page 118

NONE BETTER BUILT

Mr. Jas. K. Alexander, East New York Savings Bank, Brooklyn, N. Y., owns "Burlie," the cruiser shown above. His letter tells about her and her power plant.

April 6th, 1921

FAY & BOWEN ENGINE CO.,
Geneva, N. Y.

Dear Sirs:—

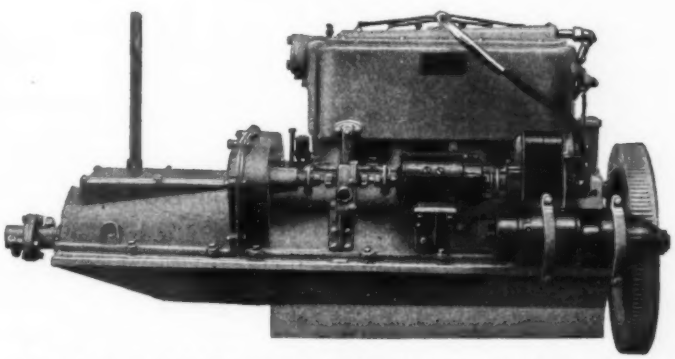
Some time ago your people asked me for a picture of my boat. I do not happen to have any at present, but I enclose a film from which you can have one made.

I would also state that last June I installed one of your LN42 20-40 H. P. Model engines and I was more than pleased with its performances and I certainly enjoyed one good season of pleasure and look forward to several more seasons of enjoyment.

My boat is a hunting cabin cruiser, 34' O. A. 8' 6" beam about 30" draft and this little motor driving a 22 x 14 3-blade propeller drives the boat a good ten miles an hour, one trip from Poughkeepsie to Belle Harbor, N. Y., in 10 hours flat, a distance of 100 to 110 miles.

Hoping this will be of interest to you and if you care to you may use this in advertising your products.

Yours very truly,
(Signed) JAS. K. ALEXANDER



Fay & Bowen Model LN 43 four-cylinder 4¾ x 5½ with electric starter

FAY & BOWEN ENGINE COMPANY

90 LAKE STREET, GENEVA, N. Y., U. S. A.

NEW YORK: 44 Third Ave. at 10th St., Sutter Bros., Representatives
PHILADELPHIA: 116 Walnut St., Marine Equipment & Supply Co., Representatives
BOSTON: 84 Atlantic Ave., Gray-Aldrich Co., Representatives

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WYMAN-GORDON
GUARANTEED FORGINGS
STANDARD OF THE INDUSTRY

GUARANTEED FORGINGS

The Backbone of the Finest Automotive Engines

WYMAN — GORDON
The CRANKSHAFT MAKERS
WORCESTER, MASS. CLEVELAND, OHIO.
CHICAGO, ILL.

G. H. MASTEN CO., Inc.

Masten
TRADE MARK

Only type that has Government Approval for Overseas.

New York Distributors for
Caille Motors and Regal Gasoline Engines
Caille 5 Speed Outboard Motor

Manufacturers of
Motor Boat Tops, Spray Hoods, Life Rafts, Life Preservers, Cushions, Swimming Belts, Cabin Upholstery, Draperies. Builders of Row boats, Motor boats, Runabouts, Cruisers

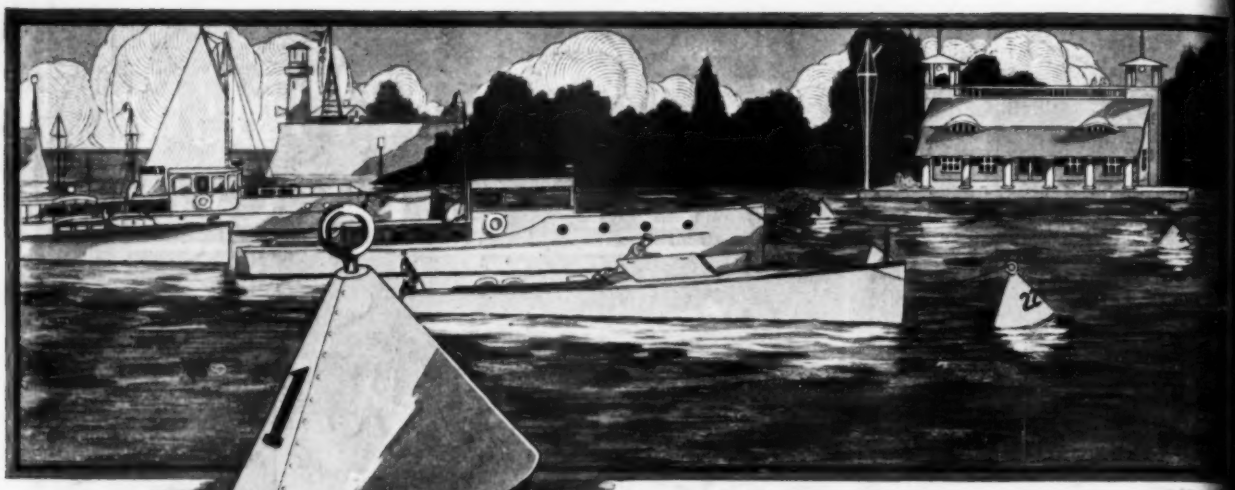
MASTEN REVERSIBLE LIFE PRESERVER

Learn to swim in half an hour with a Masten's "Liberty" Swimming Belt.
Your dealer will supply you.
Or $2.00 by mail

For Inland Waters, Rivers and Harbors equip your boat with Masten Government Approved Life Preservers

For sale by leading dealers

G. H. MASTEN COMPANY, Inc.
38 EAST 9TH ST., NEW YORK, N. Y.

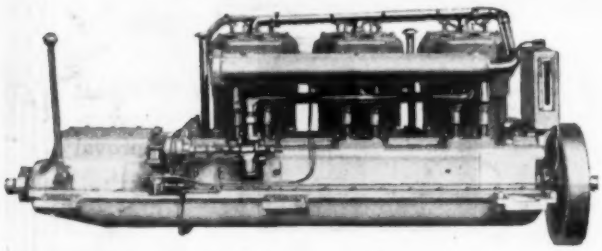


An Empty Mooring Can

Wisconsin
CONSISTENT

Marine Motors

E M 4	x 5	4 cylinder
A M 4¾	x 5½	4 "
M M 5¾	x 7	4 "
G M 4¾	x 5½	6 "
P M 5¾	x 7	6 "



In every harbor there are always certain boats which remain tied to their moorings. In those same harbors are empty mooring cans sprinkled here and there.

These empty mooring cans bear mute testimony to boats that are out on short trips or long cruises, without thought or care of mechanical troubles.

Such is the case with the Wisconsin powered boat, be it a small runabout or a large cruiser. Wisconsin owners do not experience the disappointment and troubles of having to stay "tied up."

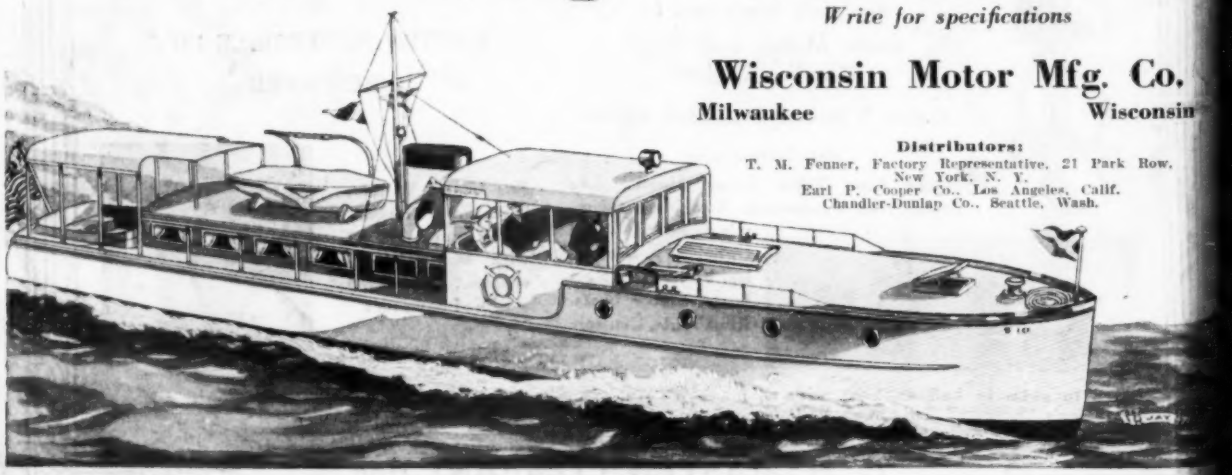
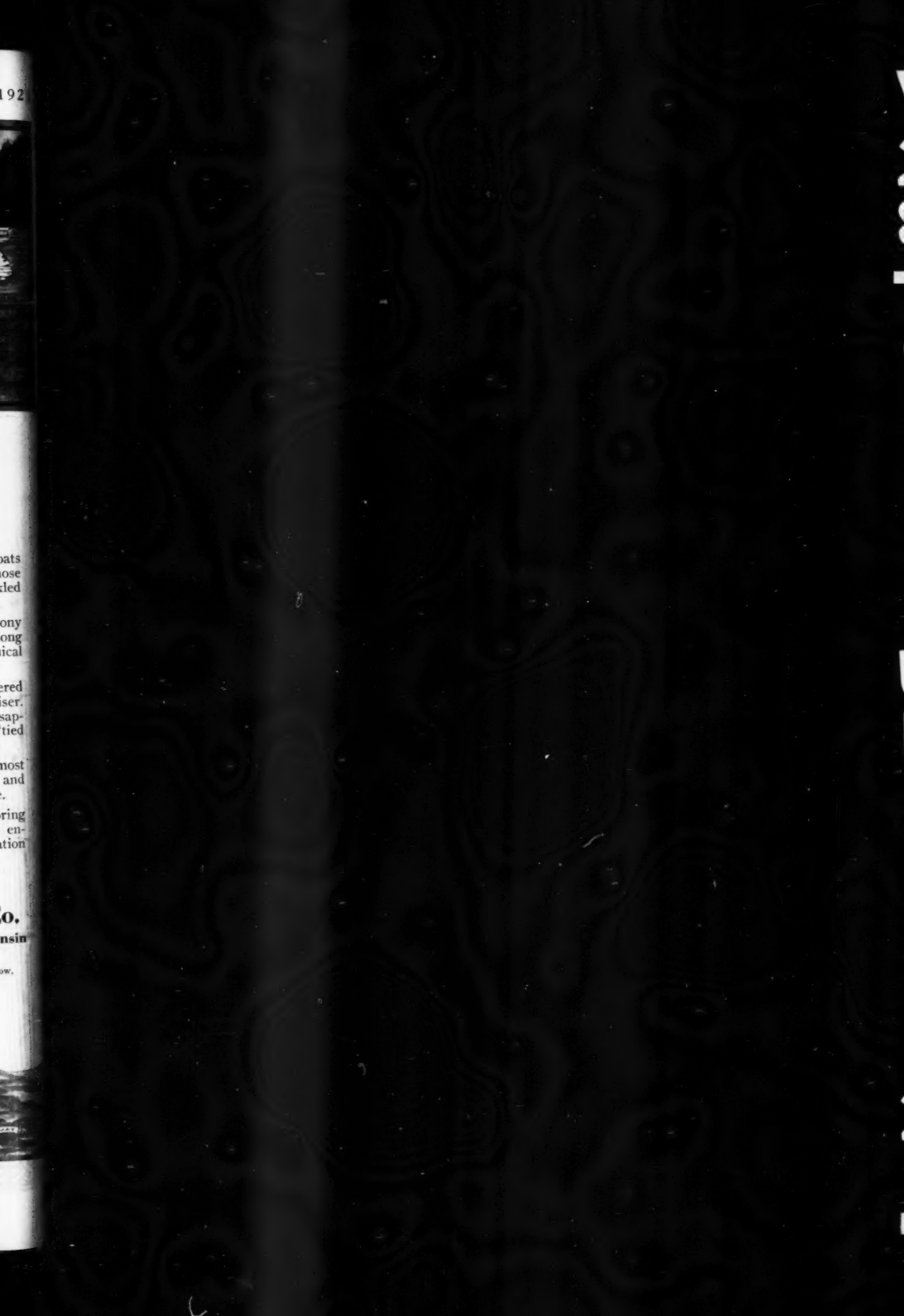
They are out enjoying their boats to the utmost to go and come at will with the satisfaction and confidence which all Wisconsin Motors give.

Add your mooring to the list of empty mooring cans and have the enviable reputation and enjoyment of a reliable boat. Let your installation be the consistent Wisconsin.

Write for specifications

Wisconsin Motor Mfg. Co.
Milwaukee **Wisconsin**

Distributors:
T. M. Fenner, Factory Representative, 21 Park Row, New York, N. Y.
Earl P. Cooper Co., Los Angeles, Calif.
Chandler-Dunlap Co., Seattle, Wash.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